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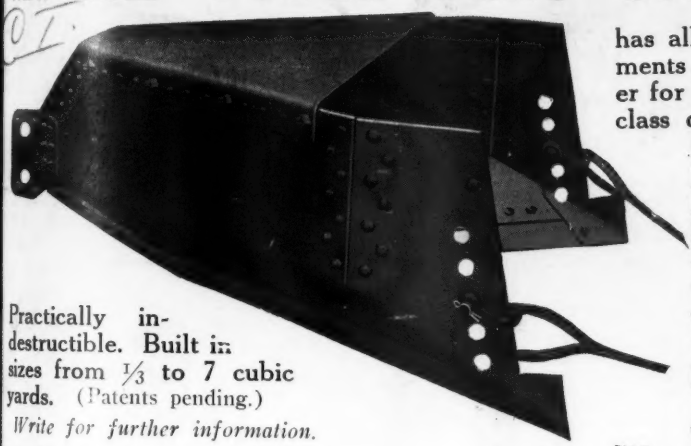

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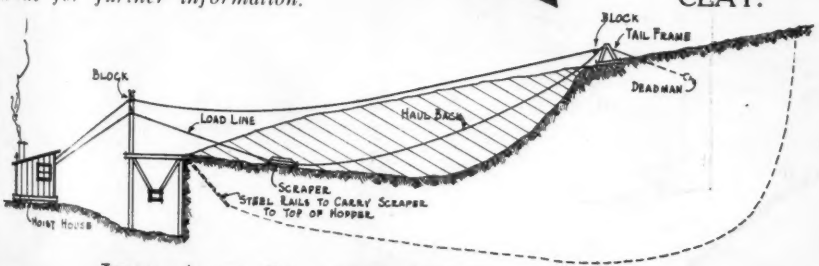

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SEPTEMBER, 1921

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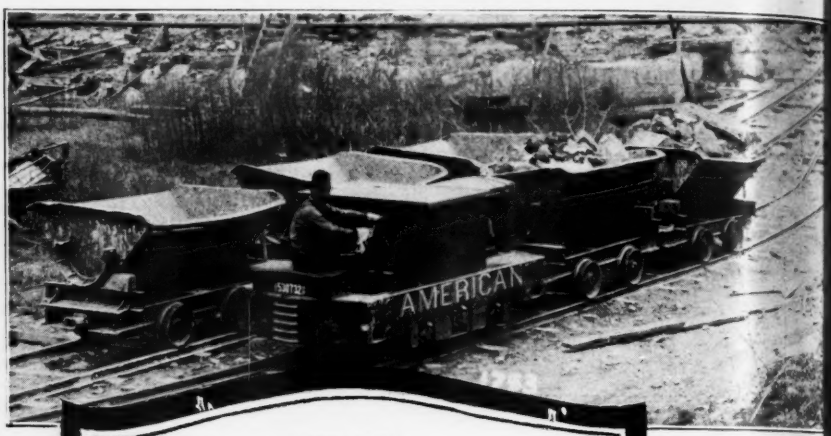

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Will greatly increase the mechanical efficiency of your plant, and at the same time reduce your operating expenses.

It is easily operated by one unskilled man, its fuel consumption is exceedingly low, and it requires practically no mechanical attention.

The construction of the American is simple and sturdy, and represents the latest word in gasoline locomotive design.

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BUCYRUS, OHIO

Pit and Quarry

Member Audit Bureau of Circulations

A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime

VOL. 5 CHICAGO, ILL. SEPTEMBER, 1921 NO. 12

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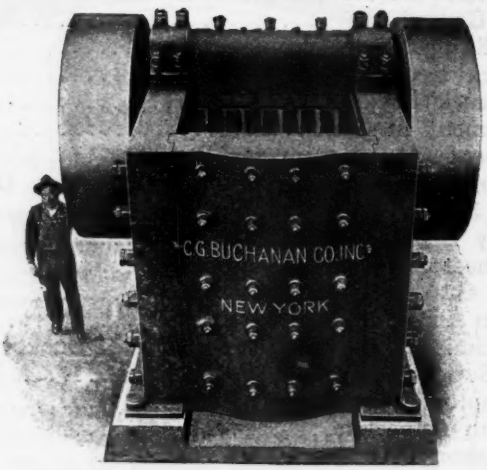

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Pit and Quarry

Vol. 5 Chicago, Ill., September, 1921 No. 12

HOOVER IS FOR IT!

WITH so distinguished a citizen and high public official as Herbert Hoover urging the making of fall contracts for road work upon the governors of the states, we ought to make some progress in the direction of a longer and more efficient construction season.

Here it is the first of September and Illinois is just letting its largest grist of road contracts — supposedly for 1921 work, mind you. While this is divided up into a large number of small sections, some of it will inevitably go over until 1922; and while we ought to have had it this year, such parts as are left over will make the nucleus of a program for another working season.

But the general principle of the fall contract is indubitably correct and cannot be ignored much longer. It is not primarily in the interests of the material producer, whose wishes must always be subservient to the general good; but the big idea behind the movement is to get a larger mileage of highway completed, to reduce unemployment, to equalize and stabilize industry.

Incidentally the material producer will benefit largely. He can in some cases pile up a surplus during the winter against an early spring demand; he can in any event know what his prospects are for the season and can get an earlier start when winter breaks up; he can make additions, repairs and new installations, knowing that he is to have a business which will justify them; he can in many cases keep his organization together and thus be better prepared for maximum production.

Push it!

RIGHT NOW!

IN our opinion the big thing for the producer to do right now is to forget about freight rates, so far as they affect this year's business, and drive ahead for as big a production and sale as are possible under existing conditions. Freight rates are not going to be changed to make much difference in 1921 shipments.

Every man will of course keep in the back of his head the idea of a more just and equitable schedule as the ultimate goal; but his pep and energy can well go now toward making every possible delivery under present handicaps.

MORE CARLOADS!

A CANVASS made by the railroads shows that for the seven weeks ending July 16, the loading of sand, gravel and stone increased 50,280 cars, or more than 33⅓ per cent over the corresponding period of 1920.

Ben Stone has now applied for membership in the Illinois Concrete Aggregate Association, of which he was formerly business manager. While the Merom Gravel Company of which he is manager, has its main office in Indianapolis, the plant is near the state line and does considerable business in Illinois.

General View of Plant of Charles Stone Company

Charles Stone Company

One of the Well-Known Plants for Producing Agricultural, Roadmaking and Fluxing Material

THE quarry proper of The Charles Stone Company is located at Whitehill, Johnson County, Illinois, on the C. & E. I. Railroad. The stone in high grade limestone of unusual value for soil improvement of the Southern Illinois farms and also shows high abrasive tests as required for construction of Illinois highways. It is a valuable stone for fluxing purposes and the company enjoys a very nice business on this product with the Chicago foundries.

The quarry was opened in 1913 and plant erected at a capacity of 1,200 tons per day. It has a double track connection with the Chicago & Eastern Illinois Railroad, affording storage capacity for 20 empty cars and thirty loads. Loading is done by hand, then 5-ton quarry cars are moved by gravity to the incline after being started with a small tugger. The plant is equipped with track scales for weighing quarry cars and also with railroad scales of 200,000 pounds capacity for weighing out the railroad cars when loaded.

The quarry tracks are above drainage, thus keeping quarry dry throughout the entire year. The height of the face is 118 feet and drilling is done with a blast hole drill, spacing holes 28 feet back from face and 15 feet between holes. A recent shot was made in which 15,000 pounds of dynamite was used, securing approximately 70,000 tons of stone, all of which was broken in fairly good shape for handling, with the exception of perhaps 15 or 20 per cent of large stone that will be drilled with jack hammer air drills.

A 90 foot stiff-leg derrick is set up near the plant and a pit quarry has been opened at that point, sinking to

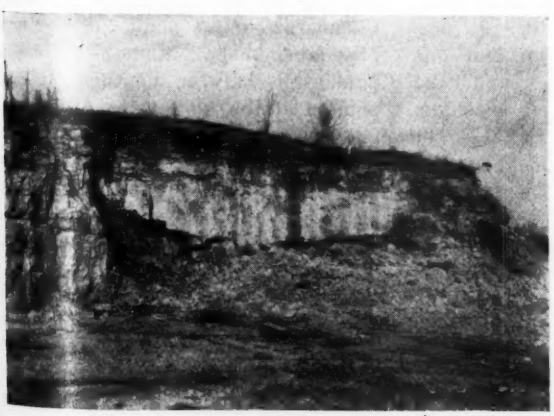
a depth of 50 feet following up the ledge that has been opened in the quarry proper, as described above. Stone at the derrick is loaded in skip boxes which are handled direct from pit to crusher. The quarry proper can be operated independent of the pit quarry, or the pit quarry with derrick can be operated independently of the open quarry.

Stripping averages from 2 feet to 8 feet and this is removed by a traveling derrick equipped with clam-shell bucket.

The approximate quantity of stone available above loading trucks exceeds 20,000,000 tons and the pit quarry as described will afford that much more, or an additional quantity depending on the depth to which pit is sunk.

The track connection with the C. C. C. & St. L. Railroad is 2½ miles distant from Whitehill, and the C. B. & Q. connections is 8 miles distant.

In addition to the crushed stone and agricultural limestone business, the company enjoys a very favorable market for riprap used in revetment work along the Ohio river, the quarry being situated 15 miles from the river and the C. & E. I. has an incline for loading on scows at that point.



After the Blast

Sandstone and Bluestone

Increased Number of Men Working in These Industries

QUARRIES producing sandstone and bluestone throughout the country employed 4,466 men in 1920, according to reports from the operating companies received by the United States Bureau of Mines. The number of workers represents an increase of 836, or 23 per cent, over the previous year. The total working time for all employees was 1,062,161 shifts, or 238 shifts per man, indicating an increase of 35 per cent in total days of labor, and an increase of about 10 per cent in working days per man, as compared with the year 1919. Over 77 per cent of the employees worked in and around the quarry pits, the remainder being employed at outside plants in crushing or dressing the stone.

Accidents caused the death of two men and the injury of 356. Both of the fatal accidents and 281 of the injuries occurred in the pits proper, while 75 injuries occurred at the outside works. Of the accidents in the pits, 38 were caused by handling rock at face of quarry, 36 each by falls or slides of rock or overburden and by flying objects, 35 by haulage accidents, 19 by timber or hand tools, and 15 by machinery. At the outside works 21 persons were injured by machinery, 14 by flying objects, 9 by falling objects, and 6 each by haulage accidents, hand tools, and falls of persons.

How to Start the Sand and Gravel Business With Limited Capital

BY DANIEL J. HAUER

THE eternal question that is asked in the sand and gravel business is, "How can I start, either owning a pit or bank or having one leased upon a royalty basis, with but limited capital?"

The answer to such a question depends upon many conditions, yet in spite of this some general advice may be given that is applicable to many cases.

One of the first things to do is to hire an expert, but this is seldom done, as few men with limited capital feel that they can afford the expense of such a man. Yet they will follow their own ideas or those of some one who is giving free advice or has something to sell, and before they are able to start doing business have spent all their money, so that some one else steps in and buys the plant they have built and reaps the benefit of the first man's work and his expenditures. However, men do not change and most must learn through personal experience, thus becoming sadder but wiser.

Passing this by, the first consideration is to purchase as little as possible. This does not mean that one should begin excavating sand and gravel by hand methods. It is seldom that a man can compete with larger producers by such methods. Not only is his output small but the cost will prove excessive. A man should only consider some mechanical means of handling his products.

He can, though, start out by saving much in the way of purchases. If he controls his deposit by paying a royalty, this will save him a capital investment, for he will only have to pay for his products as he sells them. Today he will want trucks and possibly some teams for delivery. Instead of owning these at the start he can hire such as are actually needed. This means another saving in capital and also that payment will only be made when products are actually sold. As the business is developed and money is made, if it is deemed advisable, teams and trucks can be purchased.

With these financial matters arranged, more capital is available for the excavating and grading plant.

Machinery can, as a rule, be purchased on a least sale agreement. This means that the purchaser pays, upon receipt of machinery or upon making the contract, from 20 to 40 per cent of the purchase price. The rest is divided into a number of monthly payments. The agreement sets forth that the property is that of the seller, until the last payment is made, each payment being secured by a note. This means that but little money is needed to secure the necessary machine, the terms depending upon the ability of the purchaser to bargain and his reputation for meeting his obligations.

The rest of his plant, such as bins, etc., must be built and the labor part paid for weekly or monthly. If a design is gotten up for these appurtenances they should be built for the minimum cost, and at first it may be possible to get along with part, the rest being built as the business grows, yet being a well designed structure, instead of a patch work affair.

If stripping must be done it is well to select such equipment as will be adapted to both the stripping and the work of excavating the product. Another consideration to be kept in mind in selecting the equipment is to use

such machines whenever possible that will both excavate, transport and elevate the materials, for these things mean not only a saving in capital expenditure, but possibly in operation.

Then too, the equipment should be such as to allow a limited yardage or tonnage to be handled at an economical cost, yet such that if the business grows a large tonnage can be gotten out without rebuilding the plant or making purchases of new equipment. Some of the machines mentioned conform to all of these requirements.

If possible too, the same machinery should be made to excavate and store the products and when needed rehandle it from the stock piles. Remember too, in selecting machinery that those needing the least service of men and teams are generally the most economical to operate.

Many beginners in the sand and gravel business fail from attempting to build too large a plant at first; one larger than they have business for, or one too expensive for the deposit they attempt to work. It is better business to increase the size of a plant as money is being made, than to spend all of ones money in a new plant and then not have money left or sufficient credit to operate it, as the writer has seen happen in several cases in recent years.

By following the suggestions made here, it is possible to install plants in pits and banks, when the materials will be worked out in a couple of years, and yet make large profits.

With limited capital a man must watch his sales closely, selling only to those who can pay promptly and then the collections must be looked after as sharply. Many a beginner has gone to the wall because he sold large amounts to those who could not or would not pay. Don't try to run from week to week on a few cash customers, allowing big sales to be made to them, counting on getting in hand some large sums of money from these few, only to learn later that these customers have become bankrupt. Some heavy buyers cannot get credit from old established companies, so they go to a new concern, depending upon the volume of business they can offer to secure them credit, and it frequently does.

Limited capital in starting a business is always a detriment, but a man of integrity, with force of character and plenty of determination, will make a success of his business, when many others with ample capital will fail.

These few notes may help some one to solve the question asked so continually.

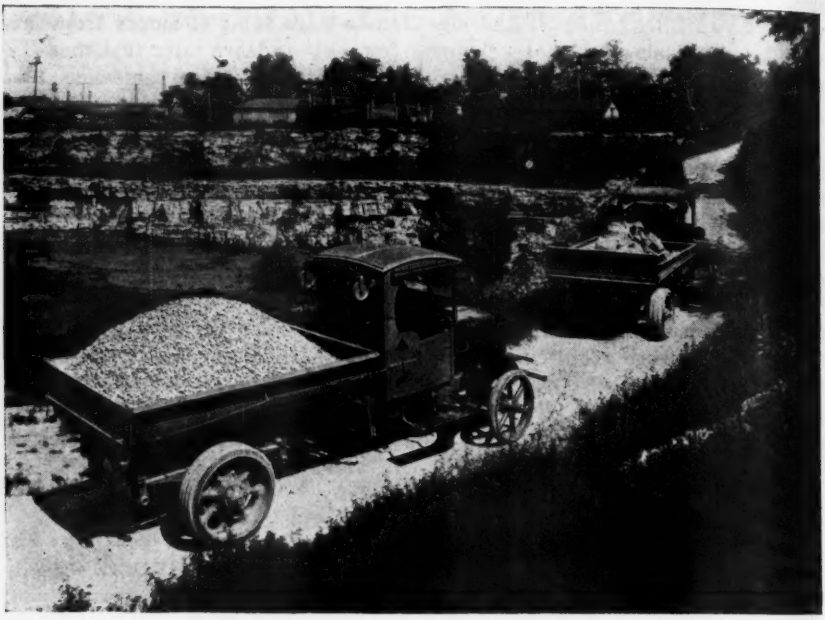
Repairs Shipped by Aeroplane

At 8:30 one morning a telephone call was received by Allis-Chalmers Manufacturing Company, Milwaukee, from the Lutz Stone Company, Oshkosh, Wis., regarding repair parts for one of their rock crushers, the plant being shut down. The parts being in stock, Mr. Lutz of the Lutz Stone Company stated that he would call for them within an hour. This was somewhat of a surprise as Oshkosh is more than three hours distant by train.

According to his request, however, the parts were delivered to the Milwaukee Air Port, seven miles from the Allis-Chalmers plant, within forty-five minutes after the call was received. Mr. Lutz called for the parts in his aeroplane, and upon reaching home was able to have his plant in operation shortly after noon.

Explosives Reduced

The Hercules Powder Company, Wilmington, Del., has announced a reduction of 25 cents per hundred pounds on the price of all Hercules high explosives. This reduction took affect August 20.



Trucks in Use at an Ohio Plant

Motor Truck Feeds a Crusher

BY DANIEL J. HAUER

FOR more than a decade gravel and sand producers, as well as quarrymen, have been using trucks for the delivery of their products to customers and with gratifying results as to both rapidity of delivery as well as economy. But strange to state, few quarrymen have used the modern truck for the delivery of stone from the ledge to the crusher.

Carts with horses were used extensively for this purpose at one time, and some quarries continue to use this method; but in most cases, cars of different sizes and types are now used. This has become a well established practice, so that it seems difficult to supplant it by other methods. During the past year, PIT AND QUARRY has received a number of inquiries as to the use of motor trucks for the service from the ledge to the crusher. Diligent inquiry has been made in many sections of the country until some examples of the use of these trucks for this purpose have been found.

At Fremont, Ohio, Grotton Bros. operate a quarry getting out crushed stone and rip rap. The rip rap is loaded by hand into Service trucks, the stone weighing from 20 to 120 pounds. The trucks travel to a nearby wharf, dumping their loads automatically into scows carrying 100 tons. This is short haul work carrying 5 tons in a 3½ ton truck, but it is not hard gruelling work of trucks being loaded by a steam shovel with all sizes of rock, and hauling only four to six hundred feet to a crusher.

For several years, though, one Serv-

ice truck has been used to deliver stone to a small crusher plant. An Osgood steam shovel picks up the blasted rock and loads it into the truck, which carries it to the crusher about 600 feet away, making the round trip about 1200 feet. The truck carries five tons, delivering to the crusher 40 tons per hour. This means eight round trips per hour, travelling 1.8 miles per hour, or 18 miles in a ten hour day. Contrast this with eighteen men, who formerly loaded six all horse dump carts and thus handled 20 tons per hour.

The stone is crushed and graded being delivered into bins, from which it is loaded onto Service trucks and delivered to contractors for use in building roads and concrete structures.

On leaving the quarry, the trucks for a distance of about 200 ft. climb very successfully a 17 per cent grade. In the accompanying photograph two trucks, one loaded with rip rap and the other with crushed stone, are seen ascending this grade, each carrying a load of 10,000 pounds.

There are no exact figures available as to the amount of work done annually with the one truck, loading at the shovel and delivering at the crusher, nor of the cost of operation and maintenance.

It is evident though that this is a flexible method of transporting rock. The shovel and trucks can be moved in any direction at any time. All track work is done away with, and a remarkable feature of quarry work is that the flow is kept clean. Steeper grades can be ascended than with dinkies and cars.

The unsightly and expensive track layouts are eliminated. The limit of the quarry work depends entirely upon the size of the crusher, as more trucks can easily be added, keeping the crusher going at its greatest capacity.

More Cement in July

Production and Shipment Both on the Increase

MORE cement was produced in the United States in July than in June, and more cement was shipped than was produced, according to figures prepared under the direction of Ernest F. Burchard, of the United States Geological Survey. Both production and shipments in July exceeded the average for July in the last five years.

The production for the first seven months of 1921 is more than 97 per cent of the quantity manufactured in the corresponding months of 1920 and more than 52 per cent of the total production in 1920; the shipments are more than 96 per cent of those for the corresponding period of 1920 and more than 52 per cent of those for the whole year 1920.

Stocks at the end of July were over 1,470,000 barrels larger than on December 31, 1920, and a little above the average for July in the five preceding years, though somewhat less than at the end of June.

The production of clinker (unground cement) during the seven months amounted to more than 53,000,000 barrels, and the July production exceeded 9,000,000 barrels. July stocks of clinker are reported as more than 4,300,000 barrels.

Production, shipments, and stocks of finished Portland cement in first seven months of 1921:

	Production (barrels)	Shipments (barrels)	Stocks at end of month (barrels)
January	4,098,000	2,539,000	10,300,000
February	4,379,000	3,331,000	11,400,000
March	6,763,000	6,221,000	12,000,000
April	8,651,000	7,919,000	12,500,000
May	9,281,000	9,488,000	12,450,000
June	9,296,000	10,577,000	11,150,000
July	9,568,000	10,301,000	10,414,000
	52,036,000	50,376,000	.....

Institutional Management For Business

(The fourth of a series of articles.)

"THAT long, large building down there was my recreation center and rest room, but it did not prove a success and it is now closed," said a quarryman as he was showing a friend over his quarry and property.

"I first leased the building to a man and he ran rather a disorderly place; I think he sold liquor and most of the time the men gambled. I got rid of him and tried several other men for short periods of time, but with poor results, so I finally shut it up. The building with its furniture, piano and other things cost me about $1,500, a poor investment."

This is the story not only of this venture but of many similar endeavors to provide men a vacation center. There have no doubt been as many failures as successes. Without knowing the details of each attempt to provide recreation for workmen it is difficult to say why each was either a success or failure, but some basic principles can be laid down, the first one being that a recreation center that is not run along institutional lines is not likely to be successful. This means that it must be run for the benefit of the institution and the men and not necessarily for profit.

Here was one of the reasons for the failure of the $1500 building of the quarryman quoted. He leased the building to a man who attempted not only to make a living off the quarryman's employees, but more than a living. The result was the sale of liquor, and no doubt without a license, meaning poor stuff and a high price. Then came gambling, and the manager no doubt had his rake-off.

Such a center cannot be run like a church institution, but it can be kept respectable, so that any woman or young girl could visit on the proper occasion; but it seldom will be so if the idea is to let it out to some man with no interest in the business or the men, except to bleed them.

It is this grasping for small profits off workmen that has prevented many a business organization from being a great success, from becoming an institution and making the men realize that their employers have more than a money interest in them.

A number of workmen must be lodged and fed and in too many cases this privilege is farmed out to some one who in his anxiety to make a living off the men will serve poor meals and cause such dissatisfaction as to lose most of the employes. Too frequently the employer shares running the lodging house, causing an extra profit to be wrung from the men. There have been boarding house contractors who have made comfortable fortunes from feeding and lodging men.

Employers say they cannot be bothered with such a detail, and that it is too expensive to employ cooks and to run such a place, with the attending worries and troubles, the petty thieving and the unreliability of those employed to run a boarding house. Yet if a business is worth having and running why not attend to that part of it, the same as one does with other details, such as keeping the men's time and paying their wages? Here there may be defaulting timekeepers and cashiers, and many worries and losses, yet the job is not turned over to others.

The writer has had a vast experience in housing and feeding men, and knows that it means work and constant attention to do it properly; yet from his own experience and from that of others, he knows it can be

done, and successfully, and that in the end it pays. There is no reason why the men should not pay a fair price for the service, sufficient to cover the interest and depreciation on the investment, the labor service furnished and the food eaten. If good food is given so it is not wasted, it is nearly always possible to feed men well without sustaining a money loss, and frequently with a reasonable charge a profit may accrue. To accomplish this there may be no idea of making money off the men, but simply to prevent a loss, and if money is being made it can be used, if so desired, to give the men further comfort, or for special dinners on high days and holidays. Enough money can be wasted in serving poor goods to pay the extra costs of providing a better grade of food.

It is simply another case of giving thought and study to a subject so as to know what is being done and learn how to do it in the best manner possible for the least money.

Again, stores and commissaries are run for the benefit of workmen, so many employers state; yet in most cases the benefits accrue to the employer rather than to the employees. A poor selection of goods is sometimes kept and only the cheaper goods, yet prices for first-class goods are charged, and the men or members of their family are at times treated with scant courtesy.

When a workmen is employed in a pit or quarry, he is the servant or hired man of his employer, who is the boss; yet there is nothing in this relationship to cause either one to be uncivil to the other, although there are occasions when the boss should be emphatic. The instant a workman steps into the store of his employer he is no longer the servant, but is a customer, the one to be pleased. He has no right to be rude or overbearing but he should be treated with respect, and his wishes met as to the goods he needs or may purchase.

The success of holding men at work in a pit or quarry, especially away from the larger towns and cities, is the advantage they may have of spending their money in a satisfactory manner and so its purchasing power is up to the average or better. Anyone keeping a store is entitled to make a fair profit, not only on the goods, but likewise his rent and labor employed; but to get exorbitant profits means not only to defraud the men but to drive them to seek other jobs.

It is part of an employer's duty to see that his employees can spend their money properly and that they get value received for their dollars. The employer wishes to get value received for the dollars he spends for a payroll. If he does not he is losing money, and he cannot afford to do this for long. The workman is in exactly the same position; he must get value received for his money or he is likely to go where he believes he will.

Thus a pitman or quarryman may not care to have a store for his employees, yet there may be no other means of supplying them, or the local storekeepers may carry such a poor stock of goods and ask such high prices as to compel the operator to keep a store for the protection of his men.

It can readily be understood that if an operator pays his men standard wages, has good conditions surrounding his work and is able to insure his men against high prices for goods they purchase, that workmen are not likely to leave such an employer. In other words the employer is building an institution to which his men can show loyalty.

During prosperous times men are always scarce, difficult to obtain, and hard to hold. It is then that these things count; for men are creatures of habit, and everything being equal,

they would rather stay where they are and continue in their old ways and habits than be continually changing. Naturally there are exceptions to this statement. On the other hand, workmen possessing little are quick to resent anything they consider unfair or an injustice. They have no means of fighting back except to quit their jobs, and one man dissatisfied can cause a dozen men to leave a job. Only a few days ago the writer heard a negro laborer say: "I'se got nothing, never expect to have anything, so I'se the freest man in the country. Let the boss take that dollar away from me for doing nothing and I'se gone."

In times of depression it is difficult. Then work is scarce, wages go to a lower level, and men work better and are more careful about losing their positions; yet even then it pays an employer to consider his men and their surroundings. It will mean that men can be held to their work even if wages must be reduced and the hours are broken and the pay envelope contains little at the end of the week. Loyalty is as much of a jewel then as when times are prosperous.

Thus, in building up a business, if institutional management is followed, it is possible to make a handsome profit in the business, yet some of the things conducted for the men may have to be operated at cost or even a slight loss.

A recreation center, to go back to that subject, can seldom be made to pay except in an indirect way. Even when saloons were in their heyday, the saloon had many things that could only show results indirectly. There would be the free lunch, a direct charge against the profits on the drinks and cigars. The card tables gave no direct income and even food tables were used to increase the sales of drinks rather than to show a profit on the investment in the tables.

The building for recreation should be the men's. Some one should be in charge, to keep things in order and prevent misbehavior, but it should be run with no other object in view than to please the men and afford them and their families a pleasant means of recreation.

The building should be divided into several rooms so that those who wish to read or write should not be interrupted by those who wish to play games. The men's families should share in the building, and at intervals there should be dances, moving pictures, plays, lectures and other forms of entertainment that appeal to them.

It is by means of such a center that much educational work can be done, not only among the men but with their families. The women and children are as much interested in the work of the men as the men themselves. Their living and pleasures are dependent upon the earnings of the men. Thus to let the men's wives and daughters know and understand how the men's earnings can be increased will be to help keep the men at work, and they, too, will do much to help the men adapt themselves to changes and improvements. In many cases the women will be the leaders rather than the men. The recreation building can afford to the females as much pleasure as to the men.

Fires can be started by spontaneous combustion from oily waste thrown around in an engine room. For this reason a can with a cover to it should be provided in the engine room and all old waste should be placed in it. A rule should be made that the cover must be kept on the can at all times. Every day the waste from this can should be burned in the boiler room. By this method one danger of fire around a plant is eliminated.

The Oregon City Sand & Gravel Company, with a capital stock of $125,000, has been organized by Fred F. Morey, J. H. Yates and Guy L. Wallace, at Oregon City, Ore.

What Kind of a Contract Exists When You Give a Man a Job?

THE question raised by the following letter touches everybody who has employes:—

I am going to ask you for a little enlightenment on the following question: Can one hold an employer liable for wages in case of place of business being destroyed by fire, thereby throwing me out of employment? Such was a case with me just recently. I have been with the Farmers' Union Merchandise Co. of Mt. Vernon until December 13th, 1920, when I accepted a position as manager of Mr. Goldammer's new merchandise store in Mitchell, S. D., and went to work for him in good faith, resigning my position with the Farmers' Union Merchandise Co., and also passing up an opportunity to become manager of the Farmers' Union Merchandise Co. of Mt. Vernon, S. D., with whom I had been. Now, it appears that he would be liable for my wages, as I agreed to work for him for one year at a certain salary per month, and the fire putting him out of business was no fault of mine, and also no fault of his, of course. This agreement was not in writing, but I have witnesses to that effect. But through this fire I was put out of employment and will be for some time, as he cannot build for some time. What is your candid opinion? Would like your idea on same.

JOHN T. ROESCH.

The question is what kind of a contract exists when an employer gives somebody a job. What is its duration, and what becomes of it when it is interrupted by something like a fire, which prevents service from being rendered.

The whole thing depends on the original hiring. If A & Co. say to B, "You come here and work for us. We'll give you $200 a month," or "we'll give you $2,400 a year," or "we'll give you $50 a week," there is no particular contract, except from week to week or month to month, and the contract can be ended at the will of either party. If the offer is $50 a week, the contract is really one for only a week, and so on from week to week. If it is for $200 per month, it is a contract for a month, and so on from month to month.

Some people think that when a firm says "we'll give you $2,400 a year," there is a contract for one year, but that is not the case. At least it is not necessarily the case. The cases all hold that the figure merely represents the rate of wage or salary. And so an arrangement to pay so much per year, payable so much a month, is merely a monthly contract, and cannot be enforced for any more.

The answer to this correspondent's question is therefore this: That the employer cannot be held responsible for wages after the business burned, unless there was something more than the kind of contract I have described. If that was all it was, it came to an end when the fire made it impossible to go on with it.

What kind of a contract would have made the employer liable? A definite agreement, which should always be in writing, between the employer and the employe, that the hiring shall be for the term of one year, or whatever it is meant to be. A contract like that is never ended by any interruption like a fire, and the employer is just as liable for wages after the fire as before. For instance, suppose a contract like that has been made, and the employer dies. The contract goes right on provided there is anything for the employe to do. Suppose the employer becomes insolvent or insane: it makes no difference, the contract is still in force and the employe can collect his wages just the same. The only exception to this is certain forms of bankruptcy. Where the employer is a part-

nership and voluntarily dissolves, the contract goes on unchanged. Nor does the sale of the business end it. And in the very case submitted by the correspondent, where the place of business burns down and there is no longer anything for the employe to do, he can still draw his wages if he has a definite contract hiring him for so long. In all these cases the law says to the employer, "You are responsible for this man's wages in spite of the fact that you no longer need him, for you could have protected yourself against such contingencies had you seen fit to do so." I said such a contract should be in writing, but a verbal contract is just as enforceable, though harder to prove.

The average employer is reluctant to make a definite contract with an employe, partly because he may be bound for wages under conditions such as I have described, and partly because he wants to leave himself free to fire the employe if he proves unsatisfactory. There is something in the first reason, but nothing at all in the second. You can discharge an unsatisfactory employe just as easily under a five-year contract as you can under one for a month—provided you have inserted a clause to the effect that the service to be rendered by the employe shall be satisfactory to the employer.

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The Sand Dunes of Indiana are moving inland at the rate of several hundred miles a year. It is said that only recently several carloads of the dunes had moved inland as far as Davenport, Iowa, where they were incorporated in new cement sidewalks.

The State of Indiana is seeking an injunction against the Great Lakes Sand Co., to prevent farther moving of the Dunes.

The Granite City Lime & Cement Co., Granite City, Ill., has been sold to Granite City Supply Co.

Each Day Brings Trade

Kentucky Producers Manage to Keep Up Steady Flow of Business

By Our Louisville Correspondent

THE good work of road building and street making is moving along very nicely in Kentucky, and even building operations are doing as well as could be expected under the circumstances.

In addition to road contracts and street contracts mentioned last month as having already been let, there have been some more let and still more are in the prospect for the fall. Recent road contracts let at Frankfort included a contract for macadam in Lincoln County going to William Lutes & Co., Lexington, the amount involved being $105,000. Another for improvement in Scottsville and Allen County amounting to $55,000 was secured by the Speed-Parker Company, Louisville. Also a number of maintenance contracts were secured by the R. B. Tyler Company of Louisville, which already has a number of road construction contracts and a number of surfacing and maintenance contracts.

In addition to these road contracts recently let and others which are to be let yet this fall the city of Louisville is figuring on quite a lot of street improvement and reconstruction work to start as soon as possible after September 1. Some of this work will run over till next year but it shows progress in road and street work and speaks well for the continuation of stone and gravel business this fall as well as an early start next spring.

R. B. Tyler, of Louisville, says that while he is not doing anything with his quarry plant here he has just started up two new quarry operations in addition to the one which he has been operating at Buffalo, Ky., right

along. One of the new quarry operations is at Glasgow, Ky., and the other is at Cave City. These are both crushing plants just installed and are being operated in connection with road contract work which he has in hand. Road work he says is going along very nicely but the commercial stone crushing and pulverizing business has suffered for the season partly through depression but quite largely through the handicap of high freight rates.

While the local sand and gravel people have not been rushed through the mid-summer season they feel that they are perhaps better off and have had a better volume of trade comparatively than the sand and gravel people in other parts of the country. The spring business was good but in mid-summer there was a let down. Now, however, there is some indications of revival. There is not so much in the way of advance orders but every day seems to develop enough business to keep them fairly employed and on the whole they are doing as well as could be expected in a low pressure year.

The Ohio River Sand Company is doing about a normal amount of local and shipping business and is steadily building up its supply of sand and gravel on the yards for winter needs.

Captain E. T. Slider, who in addition to looking after the operations of their sand and gravel and coal business on the New Albany side, has also been supervising the installing of machinery in their new wharf boat for the Louisville yard, has been kept pretty busy. They expect to have the new boat complete and in position at work in the Louisville yard by the first of September. Meantime they have been taking care of operations there with other temporary equipment set up for the purpose.

J. E. Lloyd, in charge of the Louisville yard of the E. T. Slider Company, says that they haven't enough in the way of advance orders to keep them busy, but somehow, each day brings its quota of work so that in the summing up they seem to have been doing very well right along. During the next month they should have a very lively business both in the carload trade and in the local demand because the fall season usually brings something of a rush to clean up construction work before winter sets in.

Broadly speaking the sand and gravel people have had a local trade about in keeping with the progress of building operations, and they have had a very good carlot trade both to dealers in the territory and for road contract work. The volume of business for road work has evidently been increased some by the concession in freight rates made to the state but there is no way to chart or measure this so as to determine the exact amount of benefits from it. It is easily evident, however, that railroad concessions have encouraged the letting of road contracts by bringing the cost down somewhat, thus making the bids acceptable as being within reason.

There has been no price fluctuations here in sand and gravel during the year, current prices having held throughout the summer at $1.30 per yard for sand, and $1.40 for gravel at the yards. Delivered prices vary according to zones. In the nearest zone, which include a radius of two miles, the delivered prices run $1.70 for sand, and $1.80 for gravel. For carload business the prices are made on a tonnage basis, the sand being a $1.00 and gravel 90 cents.

William K. Hatt, professor of Civil engineering and director of Materials Testing Laboratories, Purdue University, La Feyette, Ind., has just been appointed director of the new advisory Board on Highway Research of the National Research Council.

Two Limestone Demonstrations

BY W. A. OSTRANDER
Associate in Soils and Crops, Purdue University

IN July, 1920, the six agricultural agents tributary to Terre Haute, Indiana, decided that limestone was one of their limiting factors in putting their counties on a profitable farming basis. Consequently it was decided to give the limestone question a major place in the farm bureau activities in these six counties, composed of Parke, Putnam, Vigo, Greene, Clay and Sullivan.

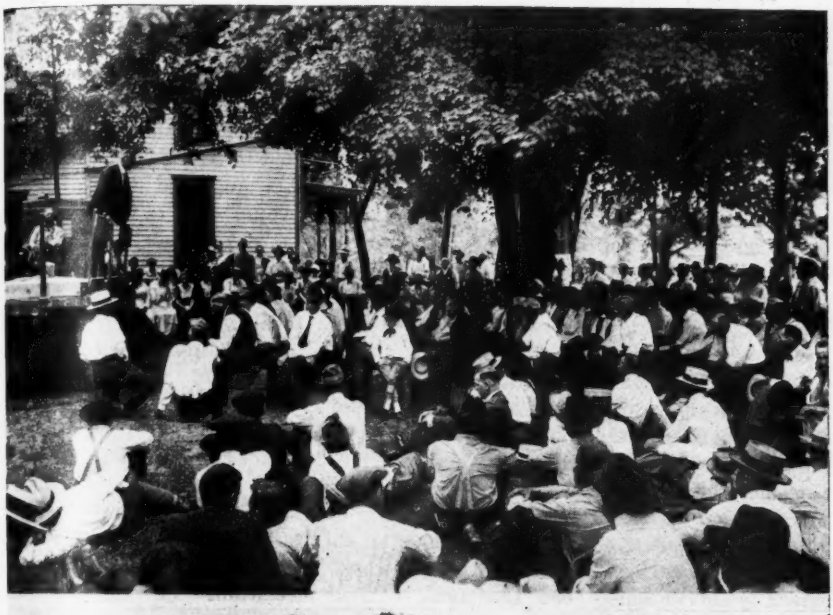
To get matters on a strictly businesslike basis, a survey was made in each county by first getting samples from at least fifteen different locations and farms in each township and testing them for acidity. This was all plainly labeled and put up in a map-like form so that each man interested could see the probable condition of his soil. Second, a survey was made as to the number of tons of limestone that had been used in the county in the last five years and the results obtained from the use of it. Third, it was then calculated in the light of the two above classes of information the number of acres of acid soil in the county. It was found that the number of acid acres run from the requirement of 260,000 tons of limestone in the lowest county to 550,000 tons in the highest county, or a total of 2,000,000 tons needed in the district; and there had been 210,000 tons used in the past five years, or practically 1 per cent.

The point then was how to organize to get a larger amount of limestone used so that clover or other crops could be most profitably grown in this section. Conferences were called in each county of not only farmers who had used limestone, but others interested.

It was found that one of the largest factors in limiting the use of limestone was the inconvenience of getting it in carload lots at opportune times. In other words, many farmers did not want to use an entire car at a time, or because of the trouble in delay, could not depend upon its arrival at a time when they could afford to spend the time to haul it and put it on the land. The logical conclusion then was to have lime shipped in, put in piles or sheds or storage bins handled by local dealers where the farmer could come any time and procure a load at a time convenient to himself, both as regards labor, condition of the roads, and the condition of the soil on which it was to be applied. After this plan was decided upon, then came the problem of finding the local cooperator to handle the limestone, in the same way that coal, feed or any other commodity now in common use is being handled and which is not handled any different than limestone will be when the farmers realize the fact that they need limestone just as they need coal and feed.

The next step in the matter was to call a conference of the railroad traffic men and agricultural men of the railroads operating in the district, to get from them their side of the transportation problem. It was found that in the past, agricultural limestone has been in demand at two periods during the year, and when placed in comparison with the movement of other commodities, it was found that these two periods were peak load movements of freight for the railroad. So one of the problems that should be solved also is the continuous freight movement of limestone during the year, or at less active periods of the year.

Lime bins would facilitate this mat-



ter, as stone could be shipped and stored in them at any time. The second point brought up by the railroad was shipment in open cars, which facilitates the loading, unloading, and the most economic hauling of the stone; and it has been shown that with types of spreaders on the market at the present time, limestone could become wet in these cars without injury to the quality of the stone, or materially inconveniencing the spreading of it.

The second group called was the agricultural limestone producers who, because of their location, would naturally supply a large portion of the limestone used in this district. These men met the situation more than half way and agreed to put out a product of the quality desired at a very reasonable rate. They too showed the necessity of shipping out the agricultural limestone as it was produced at the quarry so that it would not have to be stored in piles, later rehandling for shipping. A smaller cost could thus be made on the product because of less expense. The lime bins were satisfying this need, they thought, in that carloads could be shipped to any of the dozens of bins established as produced, the stone allowed to remain there on the company's books if so arranged until moved by the farmer, the local lime bin manager paying the freight on the car and settling with the limestone production company privately. It was satisfactory to both concerned. In this way, too, the producer of the limestone would have a better idea of how much additional output to figure on and thus obliterate the necessity of excessive installation of machinery, the storage of a large amount of stone, or the holding up of shipment of many orders from the consumer.

The first lime bin was established in January, 1921, at Russellville and the active movement of stone began. It was surprising how farmers coming in with loads of wheat, corn and livestock, would take home a load of limestone for use on their soil.

It was found, however, that many men who contemplated putting in lime bins, wanted to be shown how the limestone would move and be assured that farmers would buy it. Therefore, it was arranged that on August 2 at Lewis, Ind., a town convenient to three other counties, and on August 3, at Russellville, convenient to three other counties, demonstration meetings be held whereby farmers would come in their wagons and haul out limestone at that time. It was further decided that for an hour or more in the afternoon, some authority on limestone be invited to speak to the farmers and assist in other ways.

Demonstrations of the spreader were conducted during the day. Farmers gave their experiences on the use of stone and backed it up by showing those present that they were hauling more home.

A representative of the National Agricultural Limestone Association, C. R. Wagner, talked to the farmers, of whom there were about 450 at Lewis and 250 at Russellville.

A producer gave his opinion on the matter, the county agents told of their work that had been done, then the matter was summed up by a representative of the Soils and Crops Division of the Extension Department of Purdue. The results of the Lewis meeting were not only the hauling out of nearly three carloads of lime that day, but also the ordering of 20 additional cars to be shipped at once. The Russellville meeting was a practical duplicate of the Lewis meeting.

When it is appreciated that practically three-fourths of Indiana needs limestone to grow clover successfully and to farm most profitably and to satisfy this need nearly 12,000,000 tons

of pulverized limestone will have to be used for the initial application, it shows that only the surface in this important work has been scratched and that a large amount of pulverized limestone will have to be used before clover can be successfully grown and other crops produced more profitably over the entire state of Indiana; and that it will only be by the concerted, business-like organization and the fullest cooperation of all parties concerned that this need can be fulfilled. At the present time the railroad rates are keeping many men from moving the stone, because, as was found at Russellville, the moving of the stone about 20 miles cost more than the purchase price per ton of the material at the quarry. Farmers, however, are being convinced of the necessity of limestone and will use it at the earliest possible moment consistent with the economical operation of their farms.

Shooting Gravel Banks

WITH most modern excavating machinery it is seldom necessary to blast gravel banks as it once was when hand methods were followed in digging gravel. This is due to the fact that power machinery can loosen materials, even such as some cemented gravels, while hand power would not make an impression on such gravel banks.

But even with the strongest types of excavating machinery, it is sometimes not possible to dig cemented gravel economically without blasting it.

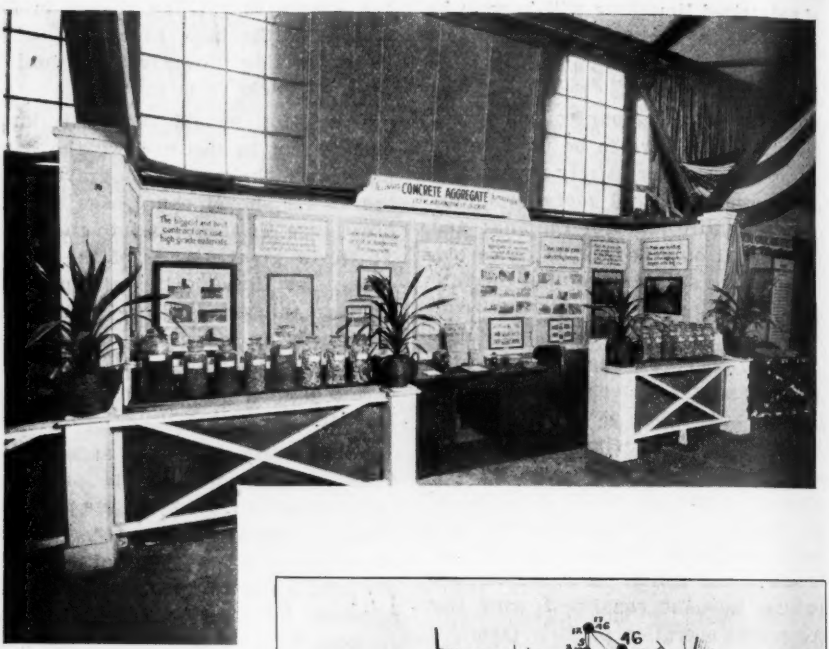
For this reason every gravel man should know how to shoot a gravel bank. If the bank is breasted up for a steam shovel, holes of some depth can be made with a well driller. The holes can be sprung once or twice. This is not necessarily done to place in the hole a large charge of powder, but simply to get the charge in the bottom of the hole, so as to hold it down, getting the greatest possible rending power from it.

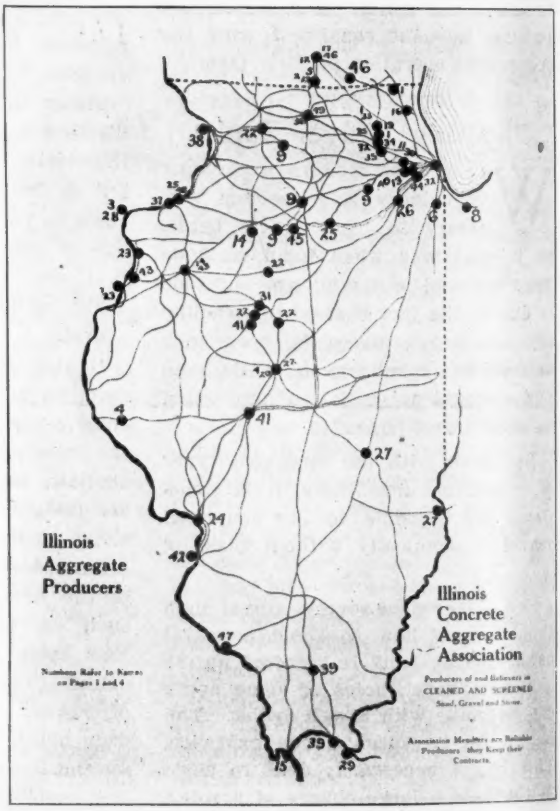
The hole should be just large enough, not to throw down the bank but to so shake up the gravel that the steam shovel can loosen it with great ease, as it works into the bank. To throw great masses of the gravel down and through the air, possibly injuring the steam shovel and other machinery, is the wrong method, and will prove expensive. The full effect of the powder in the ground cannot be obtained in that way.

A low grade explosive should also be used, such as Judson, or black blasting powder. If dynamite must be used on account of water, then it should be of a low grade of about 20 per cent strength. Judson powder is excellent for it will shake up a large yardage without throwing it down.

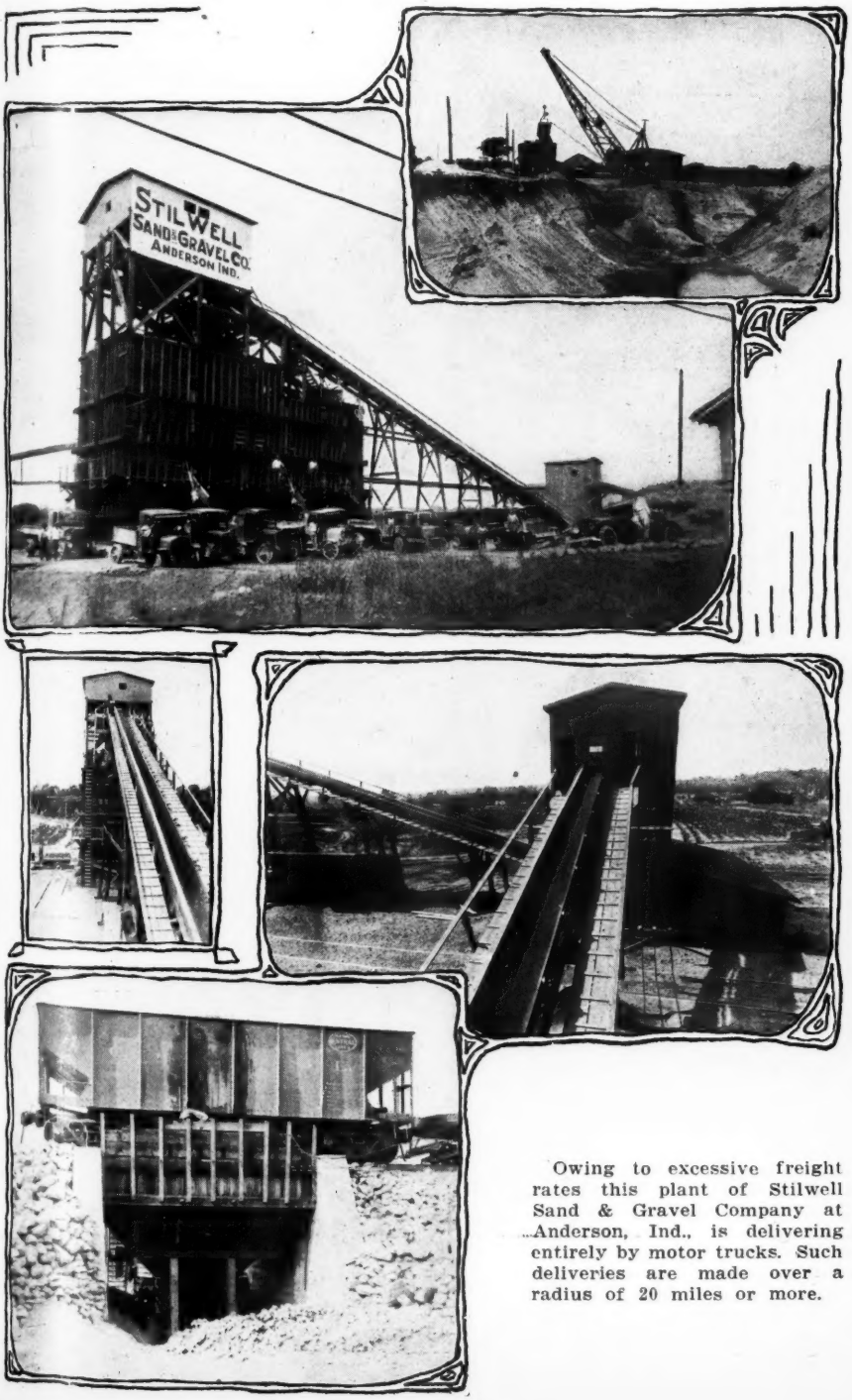
Holes should be spaced at such a distance equal to about two-thirds of the depth of the holes. The charge put in the holes should be such as to equal in pounds one-sixth of the yardage in front of a hole. This means that one pound of powder should shake up at least six cubic yards of gravel.

If the gravel is being excavated from on top, as with a drag line or some other top digging machine, then the holes must be made comparatively shallow, say not much over five or six feet. For drilling such holes a churn drill should be used, and the holes spaced apart equal to the depth of the hole. The charge should be such as to shake up and loosen four cubic yards of gravel to each pound of explosives. The same grades of powder should be used as in the deep holes. Such blasting will shake up and loosen the gravel so it can be dug rapidly and economically.

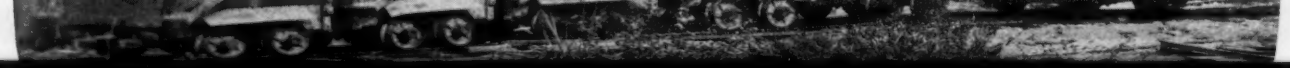




The Illinois Concrete Aggregate Association was one of the enterprising exhibitors at the recent Pageant of Progress in Chicago. A folder distributed to visitors showed a map of the state with all members indicated, and a list of members with corresponding numbers. The list also gave railroad connections and capacity of each plant.



Owing to excessive freight rates this plant of Stilwell Sand & Gravel Company at Anderson, Ind., is delivering entirely by motor trucks. Such deliveries are made over a radius of 20 miles or more.



The strong, serviceable PLYMOUTH Locomotive is always a source of profit and satisfaction to the owner. Here's what Superintendent O. A. Farmer writes:

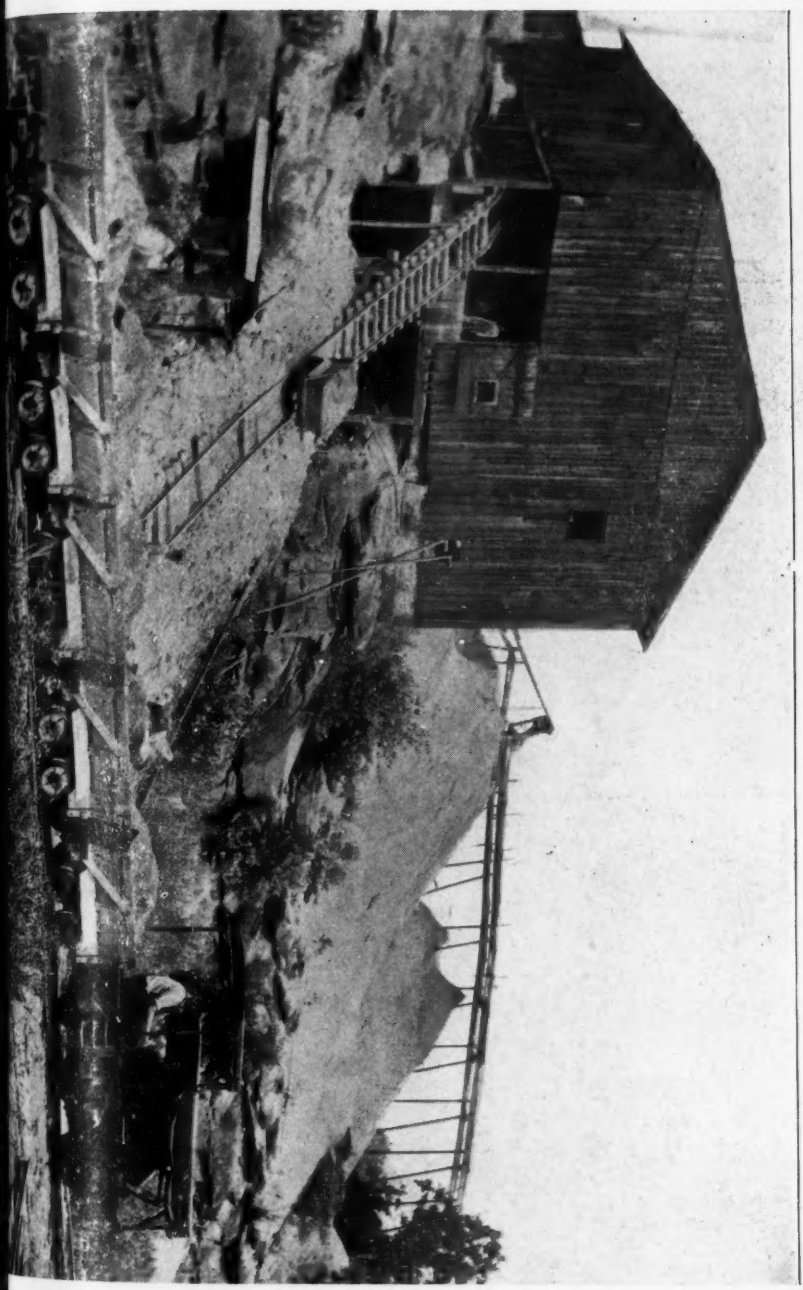
"We are mailing you photo of a 3-ton PLYMOUTH Gasoline Locomotive working at the Edward H. Everett Company's sand plant at Toboso, Ohio. Over eight hundred feet of track it hauls five tons of rock at a trip. I am highly elated over the service it gives. The up-keep is practically nothing. For the last year the only repair needed was a set of brake shoes."

The low up-keep comes out of the fact that the PLYMOUTH Gasoline Locomotive is made "a little better than necessary." Ask for literature and give us a hint of your haulage problem. It is our business to advise and help.

THE FATE-ROOT-HEATH CO., PLYMOUTH, OHIO

PLYMOUTH

Gasoline Locomotives



The strong, serviceable PLYMOUTH Locomotive is always a source of profit

New Plant of Luckey Lime and Supply Company

Double Incline to Lime Plant; Single Incline to Crusher

New Calcining and Hydrating Plant of Luckey Lime & Supply Co.

THE new lime plant of the Luckey Lime & Supply Co., Luckey, O., is a wonderful example of the progress made in the lime industry in the last few years. This plant, which is modern and complete in every detail, has six Arnold type kilns, 13 feet by 6 inches in diameter and 26 feet high above the firing floor, and will have a daily capacity of 150 tons of hydrated lime. The plant is the design of the engineering firm of Arnold & Weigel, contractor and engineers, Woodville, Ohio. There is also provision made for six additional kilns, which will make the output 300 tons per day, and the machinery, storage tanks and finished product storage house already installed will handle this increased production.

In the design of this plant, everything possible has been taken into consideration by the engineers to eliminate labor, and the results are that this plant can be operated with less labor than any other plant of equal capacity.

The stone to be used for making lime in this plant has the following chemical analysis:

Calcium carbonate	54.93%
Magnesium carbonate	45.02
Iron	.025
Silicon	.025
	100.00%

This grade stone will make a very high grade finishing lime. There is an unlimited supply of this stone, which is available by removing a very small amount of overburden.

The blasting is done by the well drill method. The holes are usually drilled about 8 feet apart in both direction and staggered. The first shot put off in this quarry loosened up about 8,000 tons of rock.

The tracks from the top of the kilns run directly down into the quarry and after the cars are loaded they are hauled up the tipple by the hoist system. They are fastened to a steel cable which passes over the tipple to the furthest end of the kilns over a series of sheaves to the electric hoists

which are at the far end of the kilns and on a level with the firing floor. The car hoists are operated by levers which control the car at will, and start, stop on reverse the car over any kiln desired. This system of operation is controlled by one man on top of the kilns.

In connection with the plant is a stone crushing plant having a capacity of 200 tons of crushed stone per day. All stone which is too fine when it comes from the quarry for economical burning is utilized in the crushing plant, to which we will refer more fully later on in this article.

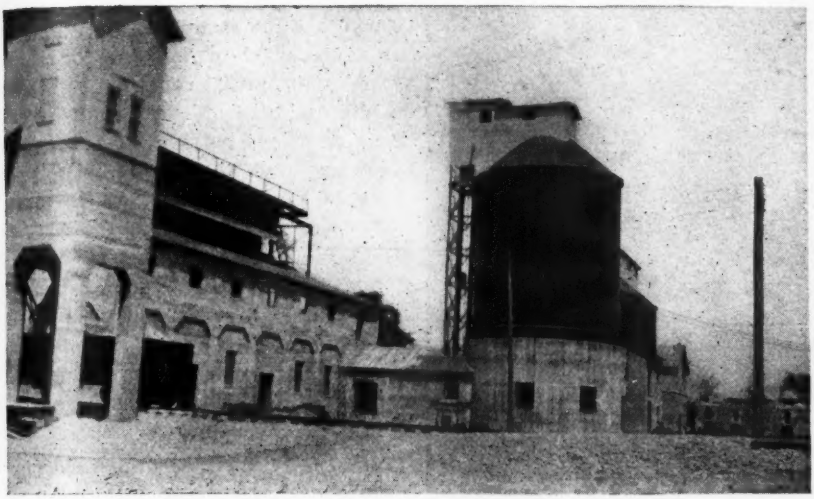
When the cars of stone are discharged into the kilns it dumps directly into the cribbing at the top of the kilns. This cribbing is for storage purposes and is continuous over the entire battery of six kilns. This insures a constant and even supply of stone at all times. A double-track system is used over the kilns, thus allowing the stone to be distributed as evenly as possible. The cars, which are of the rocker dump type, are dumped alternately from the two sides of the kilns, which still further aids in the even distribution of the stone. As the stone settles in the kilns, it is gradually and evenly drawn from the cribbed storage by gravity into the kilns, which insures at all times a full kiln.

In the kiln proper, just below the cribbing described above, the heat varies from a very small amount at the top to about 2,000 degrees at the eyes, or where the heat enters the kiln. When the stone passes into the kiln from the cribbing it is first subjected to a mild heat, which causes the stone to sweat. As the stone works down thru the kiln, the heat naturally increases, which causes the natural gases in the stone to be thrown off. This elimination of the gases leaves the stone very porous and this makes the stone more susceptible to the greater heat it encounters as it passes down thru the kiln. This allows the stone to calcine in a much shorter time than it would otherwise and also improves the quality of the lime.

Each of these six Arnold kilns has two external furnaces, built as a part of the steel shell and lined as a unit with the kiln. These kiln furnaces are hand fired, and are fitted with McGinty shaking grates, and steam is injected under the grates.

There are many new and improved features on these kilns and as stated before they have a capacity of 150 tons of hydrated finishing lime daily. The arrangement of the plant is so that an additional six kilns can be added, making a continuous battery of twelve kilns which will have a capacity of 300 tons of hydrated lime per day. The machinery and other parts of the plant are already capable of taking care of this doubled capacity. The Arnold kilns, which are special in shape, are designed along scientific lines so as to produce the best quality of lime with the most economical operating expense.

After the stone has been calcined it passes the eyes or port holes in the kiln into what is known as the cooler. These coolers are built in such a shape and of sufficient size to allow the lime to cool by radiation to a temperature of from 100 to 200 degrees. This is very necessary in the manufacture of a good grade of lime, as if the lime should be drawn hotter than this a certain percentage would recrystalize. This recrystalized lime would spoil to a certain extent the balance of the lime during the hydrating process. Another advantage of these large coolers is that if the lime were drawn too hot, much of the heat would be wasted, which is now used over again in the kiln. This not only saves fuel, but makes a higher grade lime.

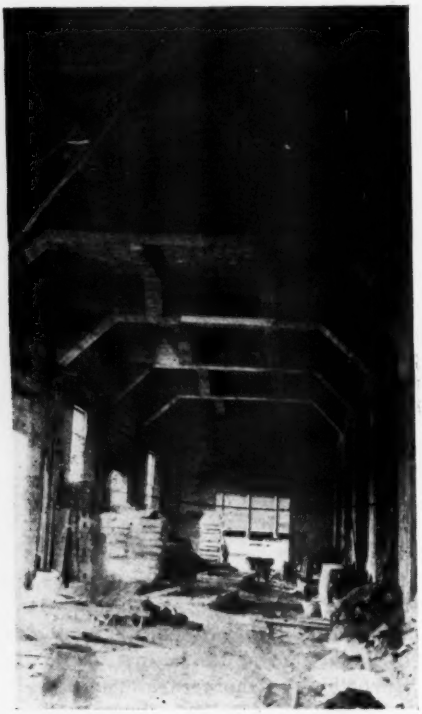


A Progress View

One of the many prominent features of this plant is the new type draw shears, and this is the first plant where anything of this nature has been used. The special feature of these draw-shears is the pneumatic operated feature. Previous to this, all draw-shears have been operated by hand arrangements of various descriptions. These air operated draw-shears are operated by a very slight movement of a lever, and furnish the quickest method of drawing a kiln that has ever been devised. These draw-shears open up their entire width, thus allowing the lime around the outer edges of the cooler to drop out as quickly as that in the center of the cooler. One of the many objections to hand operated draw-shears is the length of time it is necessary for the cooler to remain open, thus retarding the fire; but with these air operated shears, since they open up to their full capacity and the entire width of the cooler, the shears are opened and closed again as quickly as they can be operated, which has practically no effect on the fires. These pneumatic draw-shears for the entire battery of six kilns can easily be handled by one man.

In this plant the coal is handled very economically. The system receives the coal from the cars, crushes same and stores it until needed. This

Top of Kilns



Under Firing Floor

coal handling system also takes the coal from the storage and delivers it on the firing floor in front of each fire box in a convenient location for shoveling into the furnace.

After the lime is drawn from the coolers by means of the pneumatic draw shears it is picked and discharged into an apron conveyor. This conveyor then delivers the lime to a Williams hammer mill. This hammer mill crushes the lime to the size of ¼ inch and smaller. From the hammer mill the ground lime is conveyed by means of a bucket elevator and a screw conveyor to the enormous ground lime storage bins. This bin has a capacity of 1,500 tons of ground lime and is about 85 feet high. This storage tank will hold the entire output of the plant for a period of ten days or longer, and this great capacity will be of value in case of a car shortage or a tie up of any nature. From this large storage tank the ground lime is conveyed by screw conveyors to the hydrators.

The hydrators in this plant are of the Clyde batch type and are charged from a small scale bunker into which has been delivered a predetermined number of pounds of ground lime. At the same time that the lime is put into the hydrators a sufficient quantity of water is added to make the hydrate. Two Clyde hydrators take care of the capacity of 150 tons of hydrated lime. From the hydrators the lime is discharged into hoppers underneath which is a screw conveyor which delivers the lime to an elevator and then to the seasoning tanks. These tanks have a capacity of 250 tons each and are two in number. The hydrated lime is stored in these tanks for a period of from 24 to 36 hours, which gives it an opportunity to thoroughly season and any lime which possibly did not become thoroughly hydrated while in the hydrators will become completely hydrated while in these seasoning tanks.

After the lime has been in the seasoning tanks for the proper length of time it is drawn from these tanks and run through the Raymond finishing mills, which separate all the im-

Dynamite House and Barricade

purities. Any small cores or pieces of poorly burnt lime will be removed by these finishing mills. After the lime has gone through the finishing mills it is ready for the market. It is taken from the finishing mills by vacuum to the bunkers above the bagging machines, there being two four-valve Bates machines. The paper bag is simply placed on the cradle of the machine with the opening over the spindle and by the simple operation of a lever, the machines weigh out 50 pounds of hydrated lime into each bag. The lime is then ready to ship and can be trucked directly from the bagging machine to the cars.

Battery of Six Arnold Kilns

The fine lime dust, which ordinarily is wasted by being blown over the roofs of the buildings and the surrounding country, in this plant is reclaimed by the Raymond tubular dust collectors. Aside from the saving in the labor usually required to keep the roof of the building reasonably free from dust, these collectors reclaim this very fine lime dust and draw it down to the shipping floor, where it is put in bags and finds a ready market for purposes where an extra fine grade of hydrated lime is required.

The combined capacity of the ground lime bin, the two seasoning tanks and the storage space for the finished product, is sufficient to allow the plant to run full force for a period of about 18 days in case of a car shortage without resorting to slow firing of the kilns. Slow firing spoils the product and every possible arrangement has been made to make this unnecessary.

The stone crushing plant in connection with this plant is a separate unit from the main plant and all stone taken from the quarry which is too fine for economical burning is disposed of at a good profit as crushed limestone. At the present time the stone for the crushing plant is taken from the quarry with a stiff leg derrick, which carries the fine stone in buckets and drops it in a hopper from where it is put in rocker dump cars which take it up over the tipple on the same principle as that used on the lime plant tipple. This stiff leg derrick and hopper are only temporary as just as soon as the quarry is opened up sufficiently to allow it, the track from the crushing plant will run right down into the quarry the same as is now the case with the lime plant track. The crusher discharges the stone into an elevator which carries it to a revolving screen; here it is sorted into three sizes. This crushed stone is stored in bins, from where it can be loaded either into trucks or freight cars by spouting.

All buildings in connection with the plant are of fireproof construction, being reinforced concrete and steel.

The Schaffer Engineering & Equipment Company, Pittsburgh, Pa., announce the combining of their administrative, sales and manufacturing departments in their new offices at 2828 Smallman street.

More Employees in Cement Plants

Increased Activity Shown by Report of Bureau of Mines

REPORTS received by the United States Bureau of Mines from all quarries that produced cement rock in 1920 show increased activity in this industry during the year. The number of men employed by cement rock quarries was 13,251, an increase of 3,805, or 40 per cent, over the previous year. Each employee averaged 321 working days during the year, and the total number of shifts worked by all employees was 4,249,485, the former figure indicating that each workman averaged 34 more days of employment than in 1919, while the latter figure shows an increase of 1,538,114 days of labor, or 57 per cent over the year before. About 30 per cent of all employees worked in or about the quarry pits, the remaining 70 per cent being employed in crushing or grinding the rock and in the manufacture of cement.

Accidents during the year resulted in the death of 39 men and the injury of 2,585, showing that for each thousand men employed during a standard year of 300 working days, 2.75 deaths and 182.49 injuries occurred. The corresponding rates for 1919 were 2.66 killed and 231.58 injured. Of the total number of accidents, 21 fatalities and 875 injuries occurred in and about the quarry pits, and 18 fatalities and 1,710 injuries occurred at the outside plants. Nonfatal injuries to men working inside the quarries were due principally to the following causes: 135 to haulage accidents, 121 to falls or slides of rock or overburden, 91 flying objects, 78 machinery, 61 handling rock at face of quarry, 50 falling objects, 36 falls of persons, 35 timber or hand tools, 28 explosives, and 23 to drilling or channeling. Of the injuries at the outside plants or mills, 207 were caused by machinery, 194 by hand tools, 179 by falling objects, 178 by flying objects, 145 by burns, 132 by falls of persons, and 125 by haulage accidents.

Among the States having the largest number of accidents, were Pennsylvania with 514, California 412, Missouri 260, Kansas 258, Texas 209, Illinois 137, New York 99, and Washington 29.

It Pays to Advertise

Wisconsin Mineral Aggregate Association Is Acting on This Good Old Maxim

WISCONSIN is this season having an unusual affliction of the pit-run menace. Specious arguments have in many cases apparently proved the worse to be the better material, to such good effect that many builders in concrete have been willing to "take a chance."

To combat this tendency the Wisconsin Mineral Aggregate Association has been running a series of advertisements in one of the Milwaukee dailies. Two of these are published each week—Sundays and Wednesdays.

One of these advertisements is shown herewith in actual size, while the line of argument of some of the others is given below:

In what condition will your concrete be ten years from today?

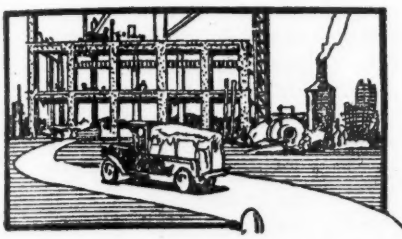
Be sure that your concrete structures, great or small, are built to last *indefinitely.*

Watch and see that only clean and well screened sand and gravel or stone are used. When cemented together, they form a solid mass that holds.

To help you secure concrete that will endure, we will gladly make thorough engineering tests of your materials upon request.

* * *

Buy your concrete on SPECIFICATION.



You can't judge concrete by the way it LOOKS.

CONCRETE *facts*

To the average man concrete is concrete—it all **looks** the same. But it doesn't **wear** the same.

Enduring concrete is made only of clean and well screened sand and gravel or stone of the right size. When cemented together it forms a solid mass that holds.

The other kind "breaks" at the slightest service. It's a constant expense and trouble.

Without cost to you—thorough analysis of your concrete materials will be gladly made on request

Wis. Mineral Aggregate Ass'n

332 First Wisconsin National Bank Bldg.
Phone Broadway 2246

Full Size Reproduction of Advertisement Run by Wisconsin Mineral Aggregate Association

You wouldn't build a home without going over the architect's plans *first*.

By the same principle, you should *know* what kind of materials enter into your concrete work.

Be specific. Insist that your contractor use only clean, properly screened materials in correct proportions.

That means concrete that will last indefinitely.

* * *

Whether you're building a million dollar institution or a fifty dollar walk —use the RIGHT concrete.

Concrete made of the right materials, cleaned, screened and correctly proportioned, has double the life of a "hit and miss" mixture.

Rigidly insist that your contractor use concrete that complies with the building ordinance.

Competent engineering tests of your materials will be gladly furnished on request.

* * *

A concrete engineer — experienced in county and state work—to give you advice GRATIS.

The valuable service of this skilled concrete specialist is gladly provided for you.

Through his complete co-operation, you will be sure to get clean, well screened materials for your concrete construction.

Whether you are building a factory, home, garage, floor, walk—he'll see that it's composed of *solid* concrete that will *endure*.

Dallas Labor Troubles

Tendency to Slow Up Material Market for the Time Being

By Our Dallas Correspondent

GRAVEL dealers of Dallas and nearby Texas towns report an increasing business during the last few weeks, but the outlook is not so bright just now on account of labor troubles in Dallas involving the building trades. Building operations are showing a slackening and the demand for gravel is weakening as a result.

The Dallas labor troubles involve the brick layers and plasterers and so far efforts to negotiate a new contract have been unavailing. Dallas is largely open shop, especially in the building trades, and many contractors seem willing to stand pat in an effort to force the open-shop agreement on the plasterers and brick layers. Members of these two unions are also standing firm and there is now a deadlock in the situation.

Contractors, through the Dallas Chamber of Commerce and Manufacturers Association, have proposed to call a halt in all building operations in Dallas until an agreement can be reached with these unions, and it now seems likely that this course will be pursued. Bricklayers are now receiving a scale of $14 a day, and the new contract proposes a reduction to $12 a day. They have refused to accept the reduction.

Road building in Dallas county is going forward and much gravel is being used in this work. Contracts have been awarded for something like 50 miles of improved highway, of which more than 25 miles will be of concrete, and work on these contracts, involving the expenditure of more than $3,500,000, are going forward. Several contractors have purchased gravel pits and are operating their own fleet of trucks and wagons and teams, while several others are buying their gravel under contract. On one of the highway contracts, the county is to furnish the gravel, sand and other material, and the contractor is to do the work. The county maintains a fleet of something like fifteen army motor trucks for hauling gravel, and these are being put in shape for work on this contract.

The J. F. Smith Gravel Company and several other companies whose pits are on railroad spur tracks and the gravel is loaded direct from the pits into cars by means of steam shovel and drag line, are working to capacity shipping gravel to contractors at work on highways in adjoining counties and for ballasting railway tracks. The Texas Midland Railway recently awarded contracts for ballasting its roadbed through the line from Ennis to Paris, a distance of 124 miles. Much of the gravel for this work will be taken from gravel pits acquired near Paris, but sub-contracts have been let to gravel men all along the line. Considerable impetus to the gravel business at points along the Texas Midland is expected to result from this contract.

Prices for sand and gravel in Dallas show no change, and the threatened shut-down in building operations so far has not affected quotations. Dealers have not been able to keep up with orders and at any event they feel that their business is safe for several weeks at least, even if the threatened shutdown materializes. Weather conditions have been favorable for gravel hauling, as there has been no rain to soften roads or put water in the pits for several weeks, and all available teams and trucks have been put into use.

The American Granite Corporation has been organized at Houston, Texas, with a capital stock of $350,000 for the purpose of operating a granite quarry

at Llano, Texas. The company has announced that it will at once construct a modern plant near Llano at a cost of more than $250,000 and that quarrying of granite will begin as soon as this plant can be built and machinery installed. Henry S. Fox of Houston is named as president of the company; John Henry Kirby, well known Houston lumber man, is vice-president, and Phil Stillman is secretary and treasurer. When in operation the plant will employ more than one hundred men and it will have a capacity of several carloads of finished product a day.

Lake Offered to City

"Let Us Have Gravel and the Rest Is Yours," Says Indianapolis Producer

By Our Indianapolis Correspondent

THE Indianapolis board of park commissioners has received a proposal from the Granite Sand and Gravel Company whereby the company would turn over without charge a lake, three-fourths of a mile long and half a mile wide, south of Kentucky avenue and west of Harding street, which will be formed by the removal of gravel. Water now covers an area of about ten acres. The offer hinged on the city lending the company $300,000, to be repaid in twenty-five yearly installments, and on condition that if the park board ever acquired an adjoining tract of land which contains a bed of gravel, that the company would have exclusive rights to remove the gravel at $3.000 an acre or 5 cents a ton. It was pointed out that the lake could be used for boating, fishing and bathing and would provide a summer pleasure spot as has been desired by the park board for some time.

Park commissioners said the offer could not be accepted legally as it stands because the city can not lend money to a private individual or firm, but that proposal may be altered so as to comply with the law by buying the entire area for $300,000 and then lease it to the company for sufficient to pay interest on bonds. The property comprises almost all the land lying between Harding street and Kentucky avenue, and the Granite Sand and Gravel Company, of which W. K. Miller is president, intends to remove gravel from about 100 acres, thus forming the lake. It was explained that the lake would have a capacity between 800,000,000 and 1,000,000,000 gallons of water and that 100,000,000 gallons could be removed daily without seriously affecting the level, thus solving the future water supply of the city.

Prices on crushed stone and gravel offered to the Indiana state highway commission have declined to 80 cents and 50 cents a ton, respectively, Lawrence Lyons, director of the state highway department, announced. It has not been many weeks since the stone men were asking $1 or more a ton, and the gravel men 75 cents or more a ton. The commission, however, does not intend to buy more stone and gravel now than is necessary, especially in case these materials must be transported by railway. Mr. Lyons said the state bought $402 worth of gravel at Columbus recently, and had to pay $524 to get it transported thirty-four miles to Crothersville. He said that freight rates on these materials, ranging from 84 cents to $1.26 a ton, will deter the commission from buying much stone and gravel.

Sale of property at 349 West Washington street, Indianapolis, to Jesse A. Shearer, president of the Indiana Gravel Company, was announced recently. The property has a frontage of 17½ feet in Washington street and the price paid was announced at $20,000. Mr. Shearer has an interest in the property on both sides of the site he has just bought, and it is thought mod-

ern improvements may be made on the three adjacent lots. Mr. Shearer said his plans for the property were not definite.

The Indiana Sand & Gravel Producers Association and the Portland Cement Association are two of several organizations of a similar nature which are organizing the Commercial Vehicle Owners Association of Indiana. The purpose of the new organization is to secure favorable legislation on behalf of the owners of commercial vehicles. At the present time there is a law in Indiana which provides for a special levy of $15 per ton capacity on all trucks in the state exempting, however, farm trucks. It was the contention by those who aided in passing the bill at the last General Assembly that trucks wore out roads and this special levy goes into the road maintenance fund. The commercial haulers contend that 90 per cent of their hauling is inside the city limits and that in fact farm trucks wear out more roads by far than commercial trucks. A test case is being fought out in the local courts at the present time.

The Myers Gravel & Sand Company at Anderson, Ind., has increased its capital stock from $10,000 to $40,000, $10,000 of the increase being in preferred stock.

The Consolidated Sand & Gravel Company, an Illinois corporation, has qualified to do business in Indiana. The company is represented in this state with 1,000 shares of stock. Chas. S. Lundin of Knox, Ind., has been named as state agent.

The Indiana Limestone Quarrymen's Association has changed its principal place of business from Bloomington, Ind., to Bedford, Ind.

The Burress Gravel Company, a new industry at Shoals, Ind., has succeeded in obtaining some favorable freight rates which will enable the company to present bids on many of the Indiana highway projects.

Eastern Producers

Market, Business and Personal Gossip From Several States

By Our Eastern Correspondent

THE sand and gravel markets at New York and surrounding districts are maintaining fair average sales, and doing far better in this respect than other different basis commodities. Stocks are being held up to a good point and dealers are not showing any great hesitancy in placing orders for reserves. The coming fall season carries aspects of growing sales and distribution, and unquestionably there is more work coming along now than in many weeks past.

Road-building continues apace. States, counties and cities throughout the eastern district are carrying out their plans for improved highways and large quantities of crushed stone, sand and cement are being absorbed in this work. Operations bid fair to hold until late in the fall, or beginning of the winter season, for there is no immediate let-up in sight, and different projects are maturing weekly. At the present time, bids are being asked for road construction in New York, New Jersey and Pennsylvania running into millions of dollars.

Prices of materials in the rock and sand industries are holding firmly to present levels. There is no indication of any early decline, and those well-informed as to the situation believe that existing levels will prevail until well into the fall season. Portland cement, too, seems to have found its proper footing, following the recent reduction, noted in the last issue of PIT AND QUARRY, and sizable quantities of the material are being turned for work of various character.

Gravel in the New York market is priced at $2.25 a cubic yard, wholesale, both for 1½ and ¾-inch sizes. At this time a year ago, the level was

$3.00. Dealers are asking $4.25 for the material, delivered on the job. With the past week's showing a decline of 25 cents a cubic yard in the wholesale markets, retailers continue to maintain quotations established some months ago. Good grade sand is $1.25 a yard in cargo lots, while dealers are pricing the material at $1.80, delivered. There is a fair demand for first grade sand at the present time.

Crushed stone is being quoted at $1.90 and $2.00 a cubic yard in carload lots, both for 1½ and ¾-inch selections. In the retail market, dealers are asking $4.00 a cubic yard, delivered on the job. The building stone branch of the industry is coming along in better shape, and while prices have declined a few cents in a number of instances, quotations, as a whole, are being stabilized at existing levels. Indiana limestone has dropped from $1.78 to $1.61 a cubic foot in the New York market, without any corresponding decline in Kentucky varieties which continue at $2.27. Bluestone is quoted at $1.85 a cubic foot, while marble varies from $2.25 to $3.00, according to selection.

Portland cement is being retailed at $3.00 a barrel in the New York district, less the customary bag rebate of 10 cents each. The past few weeks show a more encouraging trend to this branch of the trade and indications carry good distribution as the fall season turns. The mills in upper New York state as well as the Lehigh Valley section of Pennsylvania are maintaining production at a good point, with no immediate curtailment in sight.

The Lackawanna Steel Co., Buffalo, N. Y., is planning for the early resumption of operations at its Pekin limestone quarries at Niagara Falls. The plant has been closed down since late last year. Repairs to equipment have been made and a number of improvements made at the works. No announcement has been made as to the extent of operations, but under normal production the quarries give employment to about 150 men.

The Wickwire Limestone Co., River Road, Buffalo, N. Y., an interest of the Wickwire Steel Co., is reported to be planning for the early rebuilding of its power house at the limestone works at Lockport, N. Y., destroyed by fire, August 8, with loss reported at about $32,000.

The Oakfield Gypsum Products Co., Alabama (Genesee County), N. Y., has been organized under state laws with a capital of $150,000, to operate local gypsum properties for the manufacture of building blocks and kindred specialties. The company is headed by J. R. Swan, J. L. Hughes and H. F. Webster, Alabama. It is represented by Hart & Senior, attorneys, Utica, N. Y.

The Eastern States Sand & Gravel Co., a New York corporation, has filed notice of organization to operate in New Jersey. It will be represented locally by the Register & Transfer Co., 15 Exchange Place, Jersey City.

The Philadelphia Sand & Gravel Corporation, Camden, N. J., has been incorporated with a capital of $100,000 to operate sand and gravel properties in South Jersey. The company is represented by the Corporation Guarantee & Trust Co., 419 Market Street, Camden.

The Weller Construction Co. is maintaining production at its stone quarries at Greshville, near Boyertown, Pa., giving employment to a good number of workers. A number of blasts have been set off recently and large shipments made from the plant.

The Reading Quarry Co., Temple, Pa., has been adjudged an involuntary bankrupt, and it is understood that the property will be sold. Samuel E. Bertolet is referee.

The old slate quarry of the Cambridge Slate Co., Slatington, Pa., has

been placed in operation by new interests which recently took over the property. There is a good vein of slate on the site and considerable equipment has been installed, including derrick and operating machinery for production. It is proposed to develop a good capacity. The new company is headed by John Pritchard, William Williams, John Williams and Thomas Jones, all experienced in the slate producing industry.

The J. P. O'Neill Co., Pittsburgh, Pa., has been organized to deal in sand, gravel, cement and kindred materials. The company is headed by John H., Charles L., Edmund P. O'Neill. It is represented by Hugh S. Craig, 506 Beaver Building.

Sand and gravel are operating under fair activity in the Pittsburgh, Pa., market, and local producers are keeping up with the market without missing an opportunity for sales. Material at the dock is selling for about $2.00 per yard, with price of $1.60 f. o. b. float, now prevailing. Where haulage is desired, the quotations range from the basic figure to $3.00, according to the length of haul. Crushed stone in the local market is ranging as high as $6.50 a ton for 1-inch material, delivered to the job.

The Keystone Sand & Supply Co. is maintaining active production with its diggers at Coraopolis, Pa., and a good number of tows daily are coming into the Pittsburgh market. The gravel obtained at this location is of good quality and finds a ready market. Both towboats of the company, "Victory" and "Peace" have been operating between the two points. The Iron City Sand Co. is doing considerable in the vicinity of Glen Osborne, and the towboat, "P. M. Pfeil" is making numerous trips to bring in barges of sand and gravel; the company's boat, "Iron City," is also operating from this point to the Pittsburgh docks.

Lost $25,000,000

Road Bill Before Congress as Amended Is Cut Down 25 Per Cent

By Our Washington Correspondent

SENATOR Townsend has succeeded in passing his good roads bill through the Senate. The bill, which has what Senator Townsend considers the best features of the Dowell bill, passed by the House, was debated in the Senate for three days before passage. It encountered much opposition, but finally got through after $25,000,000 was lopped off, reducing the sum for the year to $75,000,000. The bill now goes to conference. In explaining the combining of his bill with the Dowell bill, Senator Townsend said:

"The so-called Dowell bill, which passed the House and came over here, and the bill which the Committee on Post Offices and Post Roads reported some time ago and went on the calendar of the Senate, were the two bills which have generally been considered, one in the House and the other by the Senate committee. The Committee on Post Offices and Post Roads have endeavored to take those two bills and harmonize their differences so as to get practically a unanimous agreement in the committee. While the measure now pending contains one or two provisions of little consequence, perhaps, which are not found in either the House bill or the bill which the Senate committee reported, it is a combination of the provisions of both bills which we thought were desirable. We thought that some of them were necessary in order to secure a compromise measure. So the bill in the form of an amendment is a complete bill, taking the place of the bill of the Senate committee and the bill which passed the House."

Senator King, at this point, inquired:

"As I understand, there has been one school of thought that has insisted that the Federal government should construct local highways, local roads, so-called rural roads, which would reach every house and every home and every farm; that the interests of the Federal Government were to be wholly subordinated to the interests of individuals within local communities, and that there was to be superimposed upon the Federal Government responsibilities which belong to local communities and to the States themselves. Upon the other hand, there have been those who have contended that the power of the Federal Government to construct highways would not permit it to construct local highways, highways for local communities and highways for the States, and who have insisted that the appropriations made by the Federal Government should be expended only upon those highways which are interstate and, in a word, national in character. May I inquire of the Senator which school of thought has triumphed in the formulation of this bill?"

"Perhaps the direct and proper answer to make to that question is that there has been somewhat of a compromise, although there is no recognition of the general principle that money can be expended anywhere that a State may desire that it shall be expended," replied Senator Townsend. "Neither have I, and the majority who felt as I did, succeeded in confining all of the money to interstate roads which serve a Federal purpose, but that class of roads is given preference. The bill provides that the States shall designate a system of roads, not to exceed 7 per cent of the highways of the State, three-sevenths of those to be designated as interstate roads, and four-sevenths as State or intercounty roads connecting with the interstate system. Then not less than 60 per cent of the Federal money shall be expended on the roads of primary or interstate importance, and the balance on the intercounty connecting roads. It is a recognition of the principle, at least, that the Federal Government shall have something to say about the location of the roads by confining these roads to a system and stating that the interstate roads connecting the States shall be given first attention. We provide for that in the amendment as we go along."

Principles of highway engineering which are expected to form the basis of education in highway transportation for the United States in the future are being compiled and will be distributed broadcast throughout the country to educators, following a conference of highway experts from governmental agencies, commercial institutions and educational centers at the University of Maryland.

Experts from governmental departments and commercial institutions and educators outlined a plan of general education in the highway problems, which will be preserved and distributed as basic texts upon which future education in these matters will be based. Economics of highway transportation, which was said to be the most puzzling carrier problem of the country, formed the basis of discussion of the conferes. Highway finance and problems of construction and maintenance also were given particular attention. Education in highway economics will be given the public through four agencies—the universities and colleges, government pamphlets, instruction and manufacturing institutions and through public mediums of information with the motion picture theater playing an important part.

Details of how some of the states disposed of the expensive road working equipment turned over to them by

the federal government for the express purpose of building good roads were given recently by Representative MacGregor of New York. Information he has been collecting will be aired before the House rules committee, the representative intimated. Representative MacGregor returned to Washington to continue intensively his own investigation of the sale at "ridiculously low prices" of this road-building machinery, and equipment. He said he has his case pretty well in hand, and so expects an early hearing before the rules committee on his own resolution providing for a definite policy for disposing of the vast war accumulation of materials by various branches of the government, particularly the Army and Navy. Representative MacGregor points out that while it is a startling situation, entirely beyond the law, for the states thus to have disposed of the material, this expose is only used by him as an illustration. What he is seeking above all else is to have a definite and proper policy adopted for the early disposal of the vast amount of property of all kinds held by the government for which it has no use.

Trap Rock Accidents

More Men Employed, But Lower Percentage of Injuries

ACCORDING to reports received by the United States Bureau of Mines from companies operating trap-rock quarries throughout the country, the industry employed 4,951 men in 1920, an increase of 221, or about 4½ per cent, as compared with the previous year. Each employee averaged 232 working days, or a total of 1,147,480 shifts for all employees. Accidents resulted in the death of 10 men and the injury of 799, each injured workman being incapacitated for at least one day. These figures indicate a fatality rate of 2.61 and an injury rate of 208.89 per thousand men employed, based upon a standard year of 300 days, as against corresponding rates of 2.56 killed and 186.47 injured a year ago.

Men working in and about the quarry pits numbered 3,369 and worked 777,262 shifts, an average of 231 shifts per man; those working outside the quarries, crushing and preparing the stone for use in concrete, railroad ballast, road work, etc., numbered 1,582 and worked 370,218 shifts, or 234 shifts per man. Accidents in and about the pits killed 5 men and injured 388, while those at the outside works killed 5 men and injured 411. The resulting accident rates per thousand men employed were 1.93 killed and 149.75 injured in the pits, and 4.05 killed and 333.06 injured at the outside plants.

New Jersey led all other States with 1,090 men employed, followed by Massachusetts with 885, Pennsylvania 752, Maryland 727, New York 631, and Connecticut 450.

The principal causes of accidents inside the quarries were flying objects 88, falls or slides of rock or overburden 51, handling rock at face of quarry 51, haulage accidents 45, machinery 26, drilling and channeling 24, falls of persons 19, falling objects 17, and explosives 13. Accidents at the outside plants were due principally to the following causes: falling objects 78, hand tools 64, flying objects 63, machinery 55, haulage 41, falls of persons 31, and burns 16.

Of the 799 nonfatal injuries, 695 resulted in disabling the workmen from 1 to 14 days, inclusive, while 104 were of a more serious nature, incapacitating each victim for more than 14 days, and 18 of them resulted in some partial disability of a permanent character.

Hyman's View of the Laws

When Not Even the Highest Court Agrees, What Can a Business Man Do?

"There ought to be some way by which a business man could find out in advance what is lawful and what is not lawful, with reference to the conduct of his business in the field of competition and alleged restraint of trade," declares David Hyman, president of the Buffalo Gravel corporation, who was indicted last Monday by the grand jury, with other directors of sand and gravel corporations.

"The method adopted in this case of charging crime against a man who has honestly tried to conform to the law and take the advice of counsel is hardly a fair way in which to settle differences of opinion between the lawyers as to what is and what is not a monopoly or restraint of competition," he added.

In an interview Mr. Hyman explained the organization of his company, the Buffalo Gravel corporation. He said there are six concerns digging gravel in Niagara river. Only four are connected with the Buffalo Gravel corporation. That these four companies cannot monopolize the gravel supply, nor dictate the price of gravel, is perfectly apparent to the mind of a business man, says Mr. Hyman, even though it may not be clear to lawyers and judges.

In March, 1919, four of the companies formed another company to take over the sale and distribution of all the gravel produced by the four companies. This was for economy sake. One selling and distributing overhead took the place of four such overheads. The one selling company could get along with fewer yards, fewer trucks, with smaller operating expenses, and yet handle all of the gravel produced and distributed to the consumers, when and where it was needed, at a large saving of expense, and with a great improvement in the quickness and dependability of service to the customer. So argued Mr. Hyman, who added:

"The prosecution concedes that we do not charge an extortionate price, or an unfair price for gravel. In Buffalo gravel costs 85 cents a ton, and $1.35 a yard, loaded on the customers' trucks. In Boston it costs $2.37; in Pittsburgh $1.07; in Cleveland $1.85; in Indianapolis $1.12; in St. Louis $1.58; in Kansas City $2; in San Francisco $1.45 a ton, as compared with the Buffalo price of 85 cents per ton. Comparing yard prices, gravel costs in New York $3.45; in Detroit $2.50; in Chicago $2.25; in New Orleans $1.60; in St. Paul $1.94; in Dallas $2.75; in Denver $2; in Seattle $1.50, compared with the Buffalo price of $1.35. I cannot understand why the Lockwood committee and the district attorney should suppress this information concerning comparative prices, or say that it is of no consequence, because I believe to the mind of the average man it is of very great consequence.

"On the theory of the prosecution, if we give the gravel away, we would still be guilty of a crime, because we operate under a contract which, according to the claim of the prosecution, might restrain competition.

"We never tried to monopolize the local gravel market. We could not have done it if we had tried. There are two outside concerns which dig gravel in the Niagara river and sell it in Buffalo. There are other competitors who ship in gravel taken from banks and pits. There are millions of tons of gravel under the waters of the lake and the river, and anyone who will buy or rent a scow, fitted with a pump or dredge, can take this to his heart's content. How can there be a monopoly, or how can prices be dictated under conditions such as these?

"We depend on the quality and the low price of our product. If our product is better and cheaper than that of our competitors, we get the business, and because it is better and cheaper is the one and only reason why we are able to stay in business.

"The contractors who buy gravel know that our service is better than the service formerly given the consumers by any one, or all, of the producing companies. The unifying of the sales and delivery end of the business under one management is a benefit to the customer and a saving to the producer of gravel.

"When the company was organized, we acted on the advice of an able lawyer. He told us then, and he tells us now, that our agreement does not create any monopoly, and does not prevent competition and it is lawful.

The lawyers who are defending us now in this case tell us the same thing.

"Here then is a difference of opinion between lawyers, for which we have to suffer indictment and prosecution. The lawyers tell us it can't be helped, and that even the supreme court of the United States divides, five judges to four, or four judges to three, in the decision of cases under the anti-trust law.

"If the judges of the highest court in the country are not able to agree among themlseves as to what is, and what is not, a violation of this law, what is a business man to do? What kind of a system is this that makes the business man find out at the peril of his liberty, whether he has transgressed the law when his intentions were honest, and his business is actually a public service and benefit, as well as a benefit to himself?

"Is it not time that there should be set up somewhere in the country a court, or commission, or tribunal, to which the business man can go and ask whether something which he proposes to do it in conformity with the law, and with the judges, and with the lawyers, that they leave things in such a state of uncertainty?"

Wages Reduced

The Colorado Lime corporation, with general offices in Denver, will reduce the wages of the employes at its calcite plant. Common labor around the plant and in the quarry will be cut 36 cents per day, according to a notice filed with the state industrial commission. At present the laborers make $3.06 per day. At the same time the men will work one hour longer each day. They now work eight hours. Lime burners will be paid $3.35 per day instead of $3.90, which they now receive. Other employes will be reduced 7 cents per hour.

Lime Plant Sells for $150,000

The Palmer Lime and Cement Co., at public sale, purchased for $150,000 from the estate of Lowell M. Palmer the quarry, lime plant and chalk factory near York, Pa. The plant remains in virtually the same hands as it has been, the sale being made to settle the estate.

The lime plant and quarry consists of 80 acres of ground and 12 kilns, with a capacity of 250 tons a day. The chalk plant has a capacity of 55 barrels a day.

Deep Dredging With a "Dreadnaught"

The high degree of efficiency to which the clamshell bucket has been developed for dredging purposes is exemplified in the Blaw Dreadnaught bucket, manufactured by the Blaw-Knox Company, of Blawnox (Pittsburgh), Pa.

Even in unusual depths of water the efficiency of this bucket is not impaired. A Blaw Dreadnaught is digging gravel in the Detroit river at a depth of 75 feet. This particular bucket was recently installed on the Steamer Frank C. Osborne, operated by the Superior Sand and Gravel Co. It is a 2-yard bucket, weighing 7,400 pounds, and provided with lips of 1¼-inch steel.

Extremely coarse material and larger obstacles which may lie buried in the river bed offer no impediment to this powerful bucket. The ability of the Dreadnaught to cope with such difficulties has been severely tested, and with "very satisfactory results," according to the statement of Kinzel-Thompson Sand and Gravel Co., of Knoxville, Tenn.

The Dreadnaught is a bucket of the lever-arm type, combining great closing power with a minimum of moving parts. The scoops are especially designed to provide good capacity of "water level" measurements, which assures an ample load when the busket is raised from under water.

Though adaptable to subacqueous service, the Dreadnaught will dig earth, bank sand and gravel, plastic and tough clay, in the dry as well as under water. It is very efficient in handling dry, granular materials, acid phosphate, broken stone, ores, etc.

In recent road construction jobs in California, bituminous material too "rich" in its composition has been and is being used. In some sections too much oil has been used, with the result that on warm days, the oil melts and "slithers" under the wheels. It is a deterrent to traction, and will in time start "crawling", causing the road to become deeply rutted.

A Letter to the Editor

In an article entitled "Draglines for Sand and Gravel" appearing on page 45 of the August issue of PIT AND QUARRY, a statement is made that might mislead some reader who has never seen a dragline cableway in operation. The erroneous statement occurs in the third paragraph when the author says that "at least half of the time of any cableway is consumed in the empty skip or bucket returning for a load." Was the writer of the article confusing the dragline cableway with some other type of cableway when he made that statement?

The true fact is that the returning of the empty bucket from the point of discharge above the gravel plant to the point of excavation is a matter of a few seconds only in any dragline cableway installation that is well designed and properly erected. By "well designed and properly erected" is meant especially the use of a mast of sufficient height to give the necessary incline to the track cable, and the use of a hoist with free revolving drums so designed as to reduce to a minimum any friction that would retard the unwinding of the cables from the drums after the bucket has dumped its load and is being returned by gravity to the excavation.

Frequent visits to a number of large gravel operations employing Sauerman dragline cableway excavators have given me an opportunity to make accurate observations based on everyday performance, often when the operator was not even aware that anybody was timing the speed of his cableway. The operating spans of these cableways varied from 300 to 700 ft. and every size bucket from ⅛ cu. yd. to 2 cu. yd. came under observation at one time or another. Digging conditions also varied, as some of the cableways spanned creeks or rivers, some were digging from deep under-water pits and some from dry pits. In no instance did the time required for the gravity return of the bucket represent more than one-fourth of the total cycle of operation.

Figures obtained from an engineer who has installed and placed in operation more than one hundred dragline cableway excavators show that the average time for a complete cycle of operation, based on the average haul of a 500-ft. span equipment is 62 seconds, of which from 11 to 15 seconds are consumed by the empty bucket returning from the top of the gravel plant to the point of excavation.

The statement earlier in the article to the effect that low first cost and low operating cost have enabled dragline cableway excavators to show a profit on many sand and gravel propositions that would not have paid if any other method of excavating and conveying had been used, is true enough, but it is also true that many large producers prefer dragline cableway excavators even for propositions where other types of equipment could be used. Whether they employ two or half a dozen dragline cableway excavators, each unit is a self-supporting investment. Any desired production can be attained by increasing the number of units. When the market is dull or there is a shortage of cars for shipping, expenses can be reduced by operating just enough units to take care of the existing demands.

As to the relative merits of dragline cableway excavators and boom dragline excavators for mining underwater deposits, does not the almost universal acceptance of the former as the standard equipment for wet pit operations, indicate its superiority?

A boom dragline is valuable in its place, but as an excavator of material under water its limited reach is a great handicap, because the edge of the cut cannot be brought close to the machine without danger of undermining due to the caving nature of ordinary sand and gravel when excavation reaches any considerable depth. Neither can it dig to the depth that is often necessary to get at the best part of an under-water pit, whereas a dragline cableway excavator with its long reach will completely exhaust these deep deposits which sometimes extend to a depth of 100 feet.

And it must also be remembered that a boom dragline when used in connection with a large plant where the screens are 50 to 90 feet from the ground, is not efficient for elevating the material and also it soon has to be supplemented with conveying equipment; whereas a dragline cableway is excavator, elevator and conveyor combined.

LOUIS McLOUTH.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20c each. State number of patent and name of inventor when ordering.

1,383,359. Fastening means for the head of gyratory crushing-machines. William S. Weston, Columbia, S. C.

1,384,051. Lifting apparatus. George N. Crawford, Chicago, Ill., assignor to Frederick C. Austin, same place.

1,384,216. Rock-drill. William A. Smith, Phillipsburg, N. J., assignor to Ingersoll-Rand Co., Jersey City, N. J.

1,384,312. Feeder or regulator for screening apparatus. George H. Fraser, Brooklyn, N. Y.

1,384,313. Feed-regulator for screening and other apparatus. George H. Fraser, Brooklyn, N. Y.

1,384,404. Mining-machine. Thomas E. Pray, Chicago, Ill., assignor to Goodman Mfg. Co., same place.

1,384,701. Shovel-tooth. William F. McMonegal, Hazleton, Pa.

1,384,819. Dump-car. Howard L. Beach, Mount Lebanon, and Willard J. Fender, Pittsburgh, Pa.

1,385,244. Vibratory-jaw crusher. Charles M. Conder and Godfrey T. Vivian, Camborne, England.

1,385,322. Excavating - machine. Conrad M. Hoffmeyer, Stratford, Ontario, Canada.

The announcement is made by F. C. Biggs, minister of public works for Ontario, that the Ontario government has decided on the construction of a cement plant of its own. The government has passed and has approved estimates for $1,000,000 which will be used entirely for the construction of a government operated cement plant, and now four or five sites are being inspected as the best location for the plant.

The Holt Manufacturing Company, Inc., Peoria, Ill., announces a substantial reduction in prices of 5-ton and 10-ton caterpillar tractors.

A small experiment with the use of calcium chloride as a dust layer is being made by the Indiana Sand and Gravel Producers Association.

New Hendrick Manager

B. G. Dann, who for the past four years has been connected with the engineering department of the Truscon Steel Company in Youngstown, Ohio, and New York City, has resigned to accept a position as manager of the New York office, 30 Church St., of the Hendrick Mfg. Company, makers of perforated metal screens, elevator buckets, general sheet and light structural work, also light and heavy steel plate construction. Mr. Dann is a graduate of the engineering department of Lafayette College.

B. G. Shotton is the manager of the Pittsburgh office of this company, located in Union Bank Building.

Power Scrapers

L. P. Green, Lumber Exchange, Chicago, says the sand and gravel people are showing considerable interest in power dray scrapers and he is well pleased with the business he is doing this year. He has made a large number of installations and is continually getting in photographs and drawings of typical layouts, and information of just what the different users are doing and what they think of his scraper. He will shortly have this information in shape to mail to any one who is interested.

New Catalogues

The Novo Engine Company, Lansing, Mich., has just issued a new catalog No. 921.

This catalog has been revised and brought up to date in all respects, featuring, in addition to the line shown in the former catalog, new designs of pumps and hoists of larger capacities, the Novo-Beach saw rig, and an 80-foot compressor outfit; the latter assembled with fan and radiator and a forced circulation water cooling system for both engine and compressor.

Farmers of Shelby County, Missouri, have organized and incorporated the Shelby County Farmers Co-operative Limestone Development Association, with a capital stock of $10,000.

A large gravel plant at Lake Emily, located a few miles south of Stevens Point, was burned to the ground recently. The property is owned by the Waupaca Sand and Gravel company.

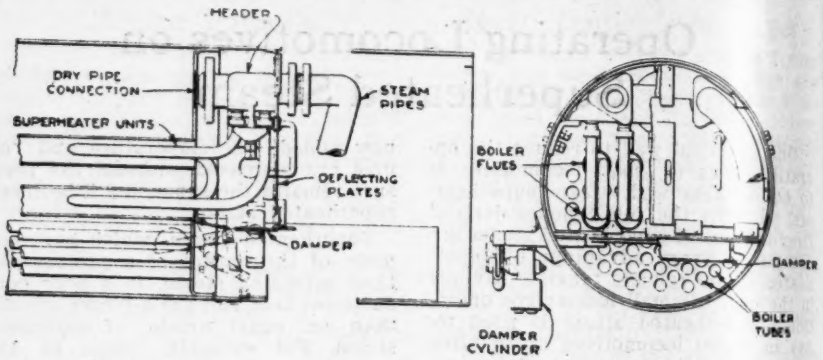
Operating Locomotives on Superheated Steam

One practical way to reduce the operating costs of small locomotives is to equip them with steam superheaters, whereby the full benefits derived from the use of superheated steam are obtained. Every advantage of superheated steam reflects tangible savings in the cost of small locomotive operation. Superheated steam is used today in 40,000 locomotives of all sizes and types; all new power is superheated and the small percentage left of the saturated steam locomotives is fast being modernized by converting them to operate on superheated steam by the application of superheaters. That the railroads, whose locomotives operate for revenue, have practically standardized on superheat, is an indication of what superheated steam has accomplished in railway locomotive service. To owners and operators of small locomotives, therefore, the subject of superheated steam becomes a most timely one to consider.

The properties of superheated steam which make for greater economy in small locomotive operation will be better appreciated by a brief explanation of the difference between saturated and superheated steam. Saturated steam has the same temperature and pressure as the water from which it is evaporated and with which it is in contact in the locomotive boiler. For each pressure the steam has a definite constant temperature. At 170 pounds boiler pressure, for example, the steam always has a temperature of 375° Fahrenheit and a volume of 2.47 cubic feet, per pound. If more heat is added to the boiler, it is transmitted to and used in evaporating more water, but does not increase the steam temperature as long as the pressure remains the same. If heat is taken away from saturated steam in doing work or by cooling, as in the cylinders and in the steam passages to them. part of the steam condenses. The amount of the steam condensed is almost proportional to the heat abstracted, and this condensed steam, or water, is inert so far as capacity for further work is concerned. When the steam, however, has left the boiler and passed into the superheater, it is separated from the water. If heat is now added, its temperature and volume are increased, although its pressure remains the same, and it becomes superheated steam.

Superheated steam, which partakes more of the nature of a perfect gas than saturated steam, is a poor conductor of heat and has a larger volume than an equal weight of saturated steam. For example, steam at 170 pounds pressure at 200° Fahrenheit superheat has a volume of 3.27 cubic feet per pound against a volume of 2.47 cubic feet per pound for saturated steam at the same pressure. When superheated steam is cooled off in the cylinders, it loses part of its superheat, but remains steam—that is, does not condense—until all of the superheat has been absorbed. Tests show that in simple saturated switching locomotives using short cut-off, cylinder condensation losses amount to over 35% of the weight of steam admitted to the cylinders. This means that for every 100 pounds of steam delivered to the cylinder only 65 pounds are available in performing work. The condensation loss, as stated above, can be overcome by the use of highly superheated steam, which means an average reduction of 35% in the amount of water, and of 25% in the amount of coal used per ton mile. Steam is superheated by means of a superheater. In small locomotives the superheater heating surface consists of small diameter steel tubing located in the flues of the boiler.

The installation of the superheater involves the replacement of some of the boiler flues with flues of larger diameter in order to receive the superheater units. Front and rear tube sheets are changed to conform with the altered tube arrangement. However, the change is simple and inexpensive. In operation, steam from the boiler passes through the throttle valve to a saturated steam chamber in the header located in the front end of the boiler. This chamber serves the purpose of distributing the steam uniformly to the superheater units or elements. These units being located in the boiler flues, as before noted, are in direct contact with the gases of



combustion at the same time that these gases pass the boiler heating surface. As the steam passes through these units its temperature is raised and it becomes superheated. In this condition it passes from the units to the superheated chamber in the header in the boiler front end, whence it passes to the engine cylinders. It will be appreciated that the control of the steam passing from the boiler to the superheater and thence to the engine cylinders is effected by the usual throttle located in the boiler dry pipe.

The location of the superheater is of interest, not only because its heating surface is in contact with advantageous gas temperatures, but also because its position does not alter the original locomotive design insofar as taking up limited locomotive space is concerned. The superheater adds very little weight to the locomotive, an advantage of great importnace especially where temporary trestles are encountered, limiting the power to the weight on the drivers, for as will be pointed out, superheated steam increases the locomotive's power for the same weight of engine.

The properties of superheated steam which make its use more effective and more economical in small locomotives may be briefly outlined as follows:

First: It does not condense until its temperature has been reduced to that of saturated steam at the same pressure.

Second: It has a greater volume per unit of weight than saturated steam at the same pressure. As its temperature increases, so also does its volume.

Third: It has a lower thermal conductivity than saturated steam, less heat will be absorbed by cylinder and pipe walls per unit of time.

The practical advantages which result from these properties of superheated steam are in general as follows: An increase in locomotive capacity, a saving in fuel, and a reduction in the amount of water used by the locomotive boiler.

Because superheated steam has a larger volume per unit of weight, less steam is used by the engine cylinders to produce the same horsepower output. In an engine using saturated steam an average of 27 lbs. of steam per horsepower is required; in a superheated engine this steam consumption is reduced to 19½ lbs. This saving in steam becomes still greater because of the elimination of condensation in the engine cylinder. The condensation in small locomotive cylinders where saturated steam is used is ordinarily high, hence there is a great saving which superheated steam effects by eliminating this loss. As a direct result of the saving in water evaporated by the boiler, a corresponding saving in fuel consumed under the boiler results from superheating.

Another direct effect of the reduction in steam consumption is the fact that the capacity of the locomotive is increased. Because the demand on the boiler for steam is reduced, a boiler steam reserve is built up which is available for increased power demands on the locomotive. With the increased capacity available by superheating, four superheated engines can do the work of five similar saturated engines—a distinct advantage where small saturated locomotives are worked to the limit of their capacity and service requirements might call for the purchasing of new locomotives.

Small locomotives frequently are operated in full capacity. With the cylinders taking steam full stroke, boiler

capacity is insufficient to supply the necessary steam. Operating superheated locomotives at full capacity is advantageous because when boilers are worked hard, fire-box temperatures are high, resulting in high degrees of superheat. The fact that greater effectiveness and economy result with the higher steam temperatures is an added advantage to superheated locomotives which are worked hard. While decrease in fuel consumption and increase in locomotive capacity are very important advantages made possible by the application of steam superheaters, there is still another advantage which in many cases is of importance. We refer to the reduction in the amount of water used by the engine.

This reduction in feed water, due as we have noted to the decreased amount of steam consumed by the engine cylinders, results in a greater effective engine tank capacity. Frequently there is a very limited water capacity on small locomotives, especially those of the saddle tank type. By conserving water, the superheated locomotive will operate for much longer periods without the delays which otherwise would be necessary to stop and take on water. The time saved is available for useful work, an advantage of importance in the care of small locomotives, because as we have noted before, these engines are not operated for revenue.

Another important advantage of superheated steam apparent to anyone who has watched a superheated small locomotive at work, or who has operated one, is the fact that the locomotive is "smarter," that it gets under way quicker and saves time in doing its work. It will be observed also that the superheated locomotive operates with less smoke than the saturated locomotive, due to a reduction in the fuel consumed. This fact is an obvious advantage where locomotives operate in or near large cities where stringent smoke laws are enforced.

The W. G. Block Company of Davenport, Ia., has taken over the Randolph Sand & Gravel Company of Randolph, Minn. Following the purchase the company was re-organized as the Randolph Sand & Gravel Products Company with the following officers: President, Fred Block; vice-president, J. A. Burnquist; secretary, S. R. McNeal.

Caterpillar Mounting Completely Lubricated

For several years revolving steam shovels have been used on mountings of the caterpillar type, to provide maximum bearing surface over soft ground. This type of tread has a decided advantage for certain classes of excavation.

Erie shovels and cranes are now being built with caterpillar-type mounting that is fully lubricated. The Ball Engine Company of Erie, Pa., builders of the Erie shovel, have recently placed this mounting on the market after three years of experiment and careful test.

The durability of the new mounting is perhaps its most important feature. After a run of 100 miles, a caterpillar-type Erie travels just as smoothly as when new.

On the New Erie mounting, every bearing is fully protected against undue wear by a film of special heavy oil, a lubricant which works equally well in hot weather or below zero. The link bearings are not allowed to run dry and "cut," but are protected like other important bearings on the Erie shovel.

A caterpillar-type Erie travels at a speed of more than a mile an hour on high gear, and climbs grades up to 25 per cent on its own power.

The lubrication of the Erie caterpillar-type mounting is easily taken care of. One filling of the oil reservoirs provides for at least a month's steady service. Once a month the operator spends about an hour in going all over the mounting with a squirt gun.

Another very important feature of the Erie's continuous-tread mounting is the perfect steering, controlled entirely by the operator from his regular position in the cab. The operator can turn sharply either to right or left, or when desired can turn right about in one spot.

The Erie caterpillar-type mounting gauge car wheels, on the same truck is easily interchangeable with ordinary traction wheels or standard frame. The result is that any Erie on traction wheels can easily be changed over to caterpillar-type, and then later changed to car wheels if desired, without any alteration to the truck frame.

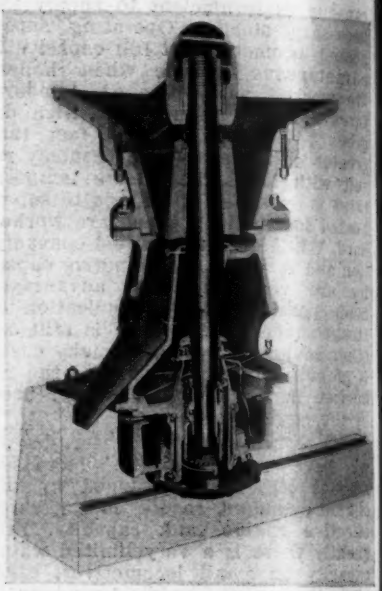
Kennedy Gearless Standard Crusher

The industries that make use of rock crushing machinery as an essential part of their operating systems are always interested in any development that promises eitner better results or lower costs. When a forward step is taken that ensures both, there can be no doubt about the value of the improvement, nor any limit to the interest awakened. Such an advance is embodied in the Kennedy Gearless Standard Crusher, an important forward step in gyratory-crusher design and construction.

This is made and sold by the Kennedy Van Saun Mfg. and Engr. Corp., 120 Broadway, New York. This concern has pioneered in this type of crusher, as Mr. Kennedy made the first gearless crusher in 1908, securing his patent in 1909.

For the last few years operators have been using the Kennedy Gearless Crusher for fine crushing with markedly satisfactory results. This machine is a highly developed secondary or recrushing unit, designed to produce finely crushed rock at a rapid rate and at low cost. The gears, heretofore an essential part of all gyratory crushers, were eliminated, and the driving power applied directly to the eccentric. This permitted higher crushing speeds without adding mechanical complications to the machine —on the contrary, a much greater degree of simplicity was attained. Every user of this machine endorsed it and found in it a new standard by means of which to measure fine-crushing efficiency. Its success has been little short of phenominal.

Overwhelming proof of the soundness of the direct-drive principle led the Kennedy Engineers to study its application to standard or primary gyratory crushers of large size. The development of the Kennedy gearless standard gyratory crusher has been over the same route that has proved so successful in the secondary crushers. It is the application of the direct drive principle to standard gyratories of all sizes, from the smallest up to and including the No. 60, the largest size of gyratory rock crusher yet built. With the changes necessary for the application of the principle to very heavy machines, the gyratory crusher is advanced to a new stage of



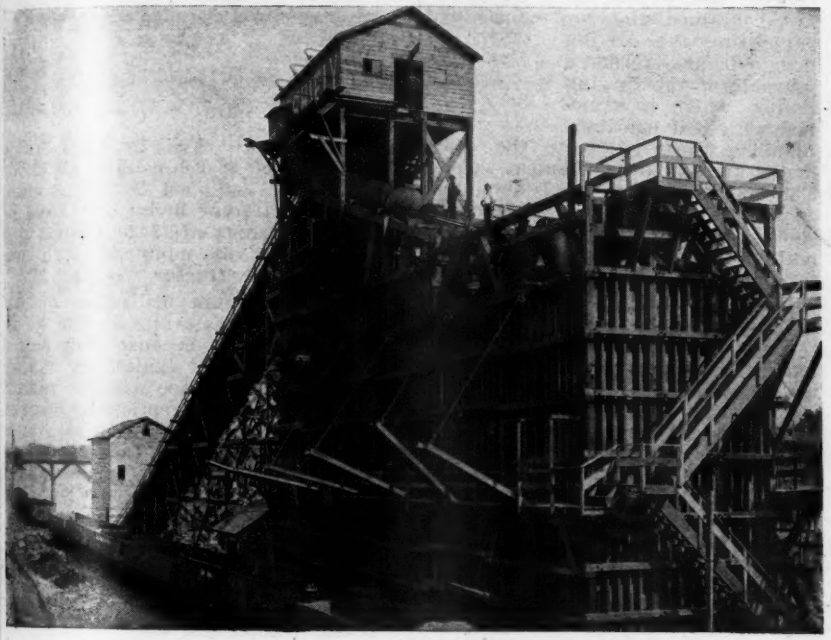
perfection. It is simplified; its wearing parts are reduced; its power requirements are diminished, and a degree of mechanical perfection attained that has never been thought of in machines of this type.

The Kennedy gearless standard crusher is shown in the accompanying illustration. It contains the well known Kennedy ball-joint eccentric, which has been widely known as the most important single advance in gyratory-crusher design since the inception of the type, because it positively maintains perfect alignment of the main shaft and its bearing in the eccentric, elimination of the possibility of cramping or binding, and consequently preventing heating, high power consumption, rapid wear and loss of eccentricity. The machine has the same highly arched spider, permitting the passage of any stone that will enter the machine; the same arrangement of spider ring clear of the top of the concaves, preventing breakage through expansion of the concave; the same perfectly operating dust collars; the same general design and construction that has made the Kennedy gyratory the most perfect machine of its type.

In addition to all of these important features, the direct drive with its manifest advantages is now embodied. The bottom plate sleeve acts

LINK-BELT

Sand and Gravel Plants



This Link-Belt Sand and Gravel Plant of the J. L. Shiely Co., St. Paul, Minn., is equipped with Dull Inclined Conical Screens and Conical Sand Separators. It is designed to wash and screen sand and gravel as well as a separate grading and washing of crushed boulders. It has a capacity of 3,000 tons daily, including three grades of gravel, two of sand and two of washed crushed stone.

A storage system consisting of two Link-Belt Belt Conveyors with trippers, is provided, to store any one of the seven grades of material produced, in separate piles.

Send for Catalog No. 440 "Link-Belt Plants for Washing Sand and Gravel." It shows what Link-Belt equipment has accomplished for many concerns, under a wide variety of conditions.

LINK-BELT COMPANY

PHILADELPHIA
Hunting Park Ave. and Pa. R. Rwy.

CHICAGO
300 W. 39th St.

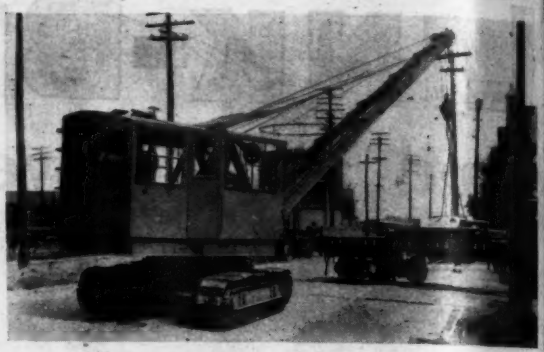
as a support for the packed lower dust collar, and as this sleeve does not revolve, the wear on the collar is reduced to a minimum. This bottom plate sleeve acts also as a support in which the eccentric sleeve and all are contained and for supporting the driving dogs. It also forms a journal for the driving pulley, which is equipped with ball bearings, reducing the friction to the lowest factor known to mechanical science. The bottom plate sleeve is shouldered on the inside to prevent the eccentric sleeve from moving upward. At the bottom it has a groove and shoulder for receiving the bayonet lock that supports the ball race and pulley.

The driving power is applied through a universal device that eliminates all friction and side strain due to the driving of the eccentric and relieves that grinding and side thrust common to all gyratory crushers.

An important improvement is made in the design of the bottom shell. The base is made square so that stone may be spouted in any direction. This enables the operator to set the machine in any position without having to predetermine whether it shall be right hand, left hand or standard, as has formerly been necessary. Thus the crusher may be driven from a line shaft by belt or rope drive, universal rope sheaves or pulley for belt drives being supplied for leading belt or ropes from pulley or motor to the crusher. The drive pulley can be on the same horizontal plane or above or below the crusher, as desired. These features enable the crusher to be installed in any kind of position without difficulty.

General Purpose Crawling Tractor Crane

The Type BC Industrial Crawling Tractor Crane, illustrated in the accompanying photograph, manufactured by the Industrial Works, Bay City, Michigan, has been developed to meet the need for a full-revolving tractor crane which can be operated independently of rails. The crane is built



in two types. The Type BC with a capacity of 20,000 pounds at 12 feet radius is equipped with continuous crawling tractor belts; the Type BT with a capacity of 18,000 pounds at 10 feet radius is equipped with four broad gauge tractor wheels.

The maximum utilization of yard storage space is realized with the use of these cranes because their field of usefulness is not limited by railroad tracks as is the case with the railroad crane. Having exceptionally large capacities in ordinary lifting they prove a valuable adjunct in those many jobs which are inaccessible to the railroad crane. They can be equipped to handle a hook and block, grab bucket, drag scraper bucket, wood grapple, electric lifting magnet, shovel dipper and pile driver leads with drop hammer.

Operation is by means of an internal combustion engine, which has the advantage of being always ready for immediate use. When not in operation no fuel is consumed and it is not necessary, as often with a steam operated machine, to have a licensed engineer as operator.

The crane is equipped with thirty foot beam made up of two channels strongly latticed with angles and tie plates.

The steering of the Crawling Tractor Crane while propelling is accurately controlled by the operator from his position in the revolving upperworks, by manipulation of the friction clutches and brakes controlling the motion of each tractor belt. By means of these clutches and brakes either tractor belt can be readily and instantly disconnected from the motor while the other belt continues traveling at the normal rate of speed.

The disconnected tractor belt can be held stationary by applying brake.